The Builder.

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*The Public Health.**

THE importance of the subject we are considering—the public health—is so great, it lies so entirely at the root of all national progress, that it is impossible to speak too strongly upon it. At the present moment, moreover, it is invested with unusually pressing interest. After a terrible visitation which has desolated homes throughout the country,—a visitation which, all evidence shows, was the result of ignorance, carelessness, and wilful avoidance of a known means of prevention, or, at any rate, of amelioration,—we note at no great distance from our shores the presence of a much-dreaded disease; and I should be neglecting a duty if I allowed this opportunity to pass without inviting all who have power to aid in making such preparations as experience shows are calculated, under Providence, to mitigate its severity should it reach us. Should we happily escape its visit, we shall still derive advantage from the steps taken. When there is no immediate prospect of danger the cost of precautions is begrudged. A large class of persons would sooner run the *chance* of death than incur the *certainty* of having to pay a pound. We are all of us gamblers, more or less, and like to take our chance.

The most vigorous and intelligent action is required on the part of our health authorities, and their hands should be strengthened by public expressions and outside aid. I am anxious not to be thought an alarmist. There is no occasion whatever for alarm,—it is, indeed, to be strongly deprecated. But it would be suicidal to think, ostrich-like, that if we shut our eyes no one will see us,—that if we say nothing about a possible danger ourselves nothing will be heard of it. The way to defeat it is to meet it well prepared. "It is now known" (says the Registrar-General, in a recent report),† "that where a place is clean, where the waters are pure, where the people are not crowded, where good administrative arrangements are made for the early treatment of attacks in the first stage of diarrhœa, the epidemic is disarmed of nearly all its terrors. But as English towns are still dirty, are dotted over with cesspools or fouled by bad drains, and the waters alike of wells and of rivers, from which towns draw their supplies, are soiled to some extent by sewage, we can at present expect no absolute immunity. Commissions and committees have left our water supply much as it was: the hard waters of the rivers are not purified by Clark's process, nor are the pure, unpolluted streams brought incontaminate down to the cities in the plains. Still, much may be done, if cholera pursue its customary course, by commencing at once all useful works of purification, so as to mitigate its virulence." And this is what all, in their several spheres, should aid in doing.

The medical officer of the Privy Council, Mr. Simon, in his instructions on the subject, recently issued, wide attention to which would prove of great value, has dwelt so strongly on the part played by polluted water in propagating the disease as to have led to the expression of fear by an esteemed member of the Association, that the public may be induced in attending to this to neglect other important inquiries. Mr. Simon says:—

"The dangers which have to be guarded against as favouring the spread of cholera-contagium are particularly two. First, and above all, there is the danger of water supplies which are in any (even the slightest) degree tainted by house-refuse or other like kinds of filth; as where there is outflow, leakage, or filtration, from sewers, house-drains, cesspools, foul ditches, or the like, into streams, springs, wells, or reservoirs from which the supply of water is drawn, or into the soil in which the wells are situate; a danger which may exist on a small scale (but, perhaps, often repeated in the same district) at the pump or dip-well of a private house, or on a large and even vast scale in the source of supply of public water-works. And, secondly, there is the danger of breathing air which is foul with effluvia from the same sorts of impurity."

Without here discussing whether the objection taken to the medical officer's expressions be sound or not, the evils resulting from the use of water containing ordinary fœcal impurities are well known. Outbreaks of typhoid fever have been traced again and again to this cause. In many cottages in low-lying land, by the side of streamlets which receive the overflow of house-drainage and other refuse, it is never absent, and cripples the working power of the country to a much greater extent than might be supposed. The serious outbreak of typhoid fever at Terling, in Essex, where, between December 4th, 1867, and January 13th, 1868, 208 persons, out of a population of 900, were attacked, was shown to be connected with the pollution, by sewage, of wells from which the drinking-water was obtained;* and many other similar cases might be adduced, some of which were made public by myself at a time when the evil was scarcely recognised. A Norwich rector has quite recently shown how within eight days, last August, the father of a family, a labouring man, and four of his children, died and were buried, the cause being, as the writer believes, "filth percolating into the well-water." The rector adds:—"I can point to four parsonage-houses around me here where deaths have occurred entirely from this same cause." I have no hesitation in saying with him that the same evil exists in thousands of houses where nothing of the kind is suspected until some severe illness breaks out and carries off its victims,—sometimes not even then. The medical officer of health for Islington, in his last report, gives the particulars of a local outbreak of fever, which serve to show how small a quantity of water so polluted will do mischief. He traced the cause of the outbreak, with much care, to sewage which leaked into an underground tank, whence milk from a dairy was adulterated with water. The dairymaster aided the officer of health by giving him a list of his customers, and it was found not only that the fever was restricted to houses supplied by this dairy, but to individuals in these houses who used that milk, while others who used a richer milk from the same dairy, not diluted with water from the tank in question, were not attacked by the typhoid fever.

London must not comfort itself with the notion founded on the amount of the recent expenditure on the main drainage, that all its cesspools have vanished, and that its sewers are now good and in a proper state. Many of them are in a dreadful condition, and thousands of old cesspools yet remain. As a rule, wells sunk into town subsoils furnish contaminated water, and should be avoided.

The fine town in which the Association is now assembled suffers greatly from the existence of middens and other dangerous accumulators of refuse. I have on more occasions than one examined Leeds, and have noted these with sorrow in scores of cases. The condition of the river Aire is very unsatisfactory, nor is this to be wondered at by those who know the amount of filth daily thrown into it. Its foul condition is a heavy tax on the cloth-makers, dyers, and other manufacturers of the town. What is the amount of the tax it lays on the health and strength, perhaps life, of the place, I will not here inquire. It is understood that the question how best to utilise the sewage of Leeds has long been under discussion by the Corporation. Let me express an earnest hope that a wise determination will soon be arrived at and acted on, and that the abolition of deadly cesspools and middens will be effected.

A lesser evil here, but one that nevertheless touches the health and pocket, is very distressingly observable to strangers. I mean the enormous amount of unconsumed smoke allowed to escape into the air, and disfigure and damage the town. The appearance of many of the fine buildings, which would otherwise adorn the streets, is miserably changed by it, and the effect produced by the general gloom upon the spirits, and consequently the health of the inhabitants, must be considerable. It is a misfortune, I am satisfied, and not an advantage, that the recent Local Act for the borough contains an exemption as to the consumption of smoke in favour of certain trades carried on here. The Royal Sanitary Commission, in their Second Report, when deprecating this exemption, speak of the manifest injustice thus done to similar works in the adjoining districts, competing in the same market as Leeds, under the more rigorous enactments of the public general statutes. The evil wrought by it in the town will be a stronger argument here, and ought to ensure its early abrogation.

Very large sums have been spent in Leeds on sanitary works, to the great credit of the town; but so much yet remains to be done that the death-rate is painfully high. The use of cellar-dwellings, of back-to-back houses, the middens, and the incompleteness of the sewerage already alluded to, are amongst the most prominent evils calling for remedy.

The death-rate in the Midsummer quarter this year was 23·2 in the 1,000,—very much higher than it should have been,—and yet we are forced to recollect that in parts of the town the rate was probably double that amount, which means that thousands of persons died simply because they were placed under more disorderly circumstances than their neighbours; and this destruction goes on year after year, surely a frightful reflection. It is well to remember that lessening the death-rate in Leeds, say only 2 per 1,000, means saving 520 lives annually.

Disappointment is sometimes felt that after considerable expenditure in a district the death rate is not reduced to the extent expected Careful inquiry would generally serve to show that the improvement made has been only partial. If the water supply has been attended to the drainage has been neglected, or if deficiencies in this respect have been remedied, the sewers are unventilated, or overcrowding, a deadly evil, has been permitted to an extent that counterbalances the good effects otherwise produced. We may rest assured, however, that every improvement of this kind made does

* The concluding portion of an address delivered at the Leeds Congress of the Social Science Association, by Mr. Godwin, as President of the Health Department.

† August, 1871.

* The *Builder*, vol. xxvi., p 105.

affect health, morality, happiness, and life, and so be encouraged to fight vigorously in aid of them. The story from Calcutta that, in consequence of the effect produced upon the health of the town by recent improvements in drainage and water supply, the undertakers were applying for compensation for loss of business, if not true, serves to show, what, in public opinion, the result of the works has been.

Many of the subjects relating to public health and social progress still offer problems for solution of extreme difficulty, and much good remains undone for want of its being known how best to do it. In confirmation of this, and for other reasons, I am tempted to mention that I have for some time been authorised by an inhabitant of London to state, that he is willing and ready to appropriate to the improvement of the health and condition of the poorer classes of the metropolis a sum equal to that given by the late George Peabody for a similar purpose—or say half a million of money, when he can see a mode of satisfactorily effecting this without the fear of pauperising the classes he seeks to benefit. Means were taken to make this offer known to a limited extent, and a large number of suggestions have been sent to the proposer, but he is not yet satisfied as to the course that can wisely be taken. We must congratulate the individual on holding in his hand the power to achieve a glorious end, and I would add a hope that he may speedily come to a wise determination. A noble example of what may be done by an employer to improve the condition of those engaged for him, is to be found in this district—I mean, of course, Saltaire, where intelligence and far-sighted benevolence have provided healthful homes, education for the children, innocent enjoyments, and means of culture. The time is coming when the history of the results of that establishment, in a sanitary and social point of view, should be written with a view to the guidance of others.

We lose, on moderate computation, a hundred thousand lives annually by preventible diseases, and millions of money in consequence of these deaths, and of premature disability in cases where death does not ensue. A million paupers receive relief weekly in England and Wales. With complete study of the laws of health, preventive medicine, and improved sanitary arrangements throughout the kingdom, the number of this melancholy army would soon be materially lessened. I have spoken of disability where death does not ensue. With reference to this let me say, we want registration of it. The registration of deaths, which is now enforced, is of the greatest value; but we need beyond that the registration of sickness, which would show the magnitude, not only of the grief and poverty to individuals caused by disease, but of the money-loss to the public. The desirability of this is fully recognised by the Royal Sanitary Commission, so that we may hope for legislation to enforce it before long.

The connexion between bad sanitary arrangements and ill-health is now largely admitted, but not fully, or we should surely not find, in unnumbered places, accumulations of filth vitiating the air, large populations drinking polluted water and debilitated by unhealthy dwellings, and preventible diseases annually carrying off their thousands, pauperising the families left behind, and injuring the whole community from the highest to the lowest. What is called for is, after all, simple. We want clean air, clean water, clean food,—*purity*, in fact. As we strive for purity in life, moral purity, so let us strive to obtain for society the advantages of physical purity. "Unto the pure all things are pure," says St. Paul (Titus i. 15), which may be true in conduct, but at present the belief may not be safely acted on with reference to the air we breathe, the water we drink, or the food we eat. Moreover, how is it possible for moral purity to be retained in such dens as those in which multitudes of our fellow-creatures pass their lives? The assertion, "As the home so the people," denounced as almost impious when first written, has come to be pretty generally accepted; but the homes in thousands of cases remain in the most wretched condition, and the natural results continue to follow.

The injury done to our agricultural population by the want of proper dwellings can scarcely be overstated; in fact, the whole condition of this part of the people is a disgrace to the age. I must restrict myself, however, to the question of health. I have visited hundreds of cottages with rooms scarcely the height of a man, damp, cold, undrained, and overcrowded, with heaps of decomposing matter around, and where, in short, everything was being done to counterbalance the advantage offered by Nature of a plentiful supply of pure air. In parts of the country where Portland cement and gravel, broken stone, or burnt clay are readily obtainable, a considerable saving in the cost of building may be effected by the use of concrete walls. It is absolutely necessary, however, that the concrete should be properly made and rightly applied; when this is the case, it is an excellent and enduring material; if otherwise, it is worthless rubbish. It may be mentioned, as it will give confidence to those disposed to employ it, that the Metropolitan Board of Works now allow the use of it within their boundaries, and that the Inclosure and Tithe Commissioners permit money lent by them for the improvement of estates, to be expended in the erection of concrete buildings. In both cases, however, the work is required to be done under stringent regulations. It is to be regretted that the number of builders who have applied themselves to the economic execution of such work is very small.

By lessening the cost of erecting cottages something is done towards inducing a proper provision of them. With good plans, wise superintendence, and the choice of proper materials, much may be done in this direction. Non-absorbent walls and floors are amongst the *desiderata*, and, above all things, such arrangements for the removal of the refuse that it shall not by any possibility contaminate the water supply.

Sound and healthful dwellings are required in towns for a lower class than have been yet thought of,—the multitude who are unable to pay more than, say, a shilling a week as rent. There is a large number of these who require only one room,—a man and his wife, without children, single men and women, and widows. There seems no valid reason why a part of the Peabody fund should not be applied to meet this want, and it is to be hoped the trustees will turn their attention to the subject at once.

The desire to produce cheap houses by speculators has necessarily this bad result, that the efforts of the builder are all directed simply to that end, to discovering the means of erecting a dwelling at the least possible cost, not in providing to the utmost extent for the health and the comfort of the occupant. If the wages of a labourer are not sufficient to enable him, by the exercise of due prudence, to pay for a decent habitation, warm, dry, airy, and well drained, calculated therefore not to destroy his health and working power, and to send him to a premature grave, and his widow and children to the union to be maintained at the expense of the ratepayers, it is time they were made so. It is found to be wise and paying policy to provide horses with good stables, and pigs with healthful styes. Surely it ought to be thought necessary to do as much for the men who drive and feed them. Among minor evils, ill-ordered dust-bins should be mentioned as the fruitful source of sickness; decomposing matter, under present arrangements, being allowed to remain in them for weeks, sometimes months, to pollute the air. Better supervision is needed. If the occupants of houses were to see that all consumable matter was burnt, the danger would be lessened, and the quantity would be so much reduced that arrangements might be made for its removal day by day.

A vast deal of ill-health, to say nothing worse, results from the too early occupation of newly-built houses. In the suburban districts of London, and of many of our large towns, small houses by the thousand are planted on the ground, often on heaps of unwholesome deposits placed there to fill up hollows whence brick-earth or sand may have been removed, are finished with pauseless rapidity, and, all reeking as they are, receive a family, often before the workmen have left. The danger involved was recognised long ago. An ancient foreign proverb says, as to a new house, "The first year for my enemy, the second for my friend, the third for myself." The speculative builder of to-day too often cares for neither friend nor enemy. The houses, like certain historic razors, are made to sell. To turn a penny is his sole object, and the buyer must look out for himself. Alas! for such a state of feeling. It unfortunately prevails in modern society to a much greater extent than is consistent with the right condition of public health, giving that word its full meaning.

Among the arrangements for furthering the object we have in view, facilities for recreation and amusement must not be forgotten. Amusement must be had, will be had, and if that which is rational and innocuous is not obtainable, less wholesome excitements will be resorted to. The provision of open and adorned places, picture galleries, social gatherings, flower shows, the practice of window gardening, facilities for obtaining books, for the enjoyment and the study of music, "penny readings," cricket, swimming, archery, drill, are all matters calling for the fostering aid of those who desire to see a good state of health prevailing, and would contribute their share in rendering the world happy, and leading to a higher type of manhood. Popular meetings for recreation have a further value as serving to bring classes together, counteracting the tendency to severance now in operation, and which has aided to produce the great danger that threatens society at this moment.

It is the opinion of some who have inquired, that we are deteriorating physically as a people; that the number of men, for example, rejected on physical grounds from amongst those who offer themselves as soldiers or policemen, is greater proportionately than it was a dozen years ago. I am not disposed to accept this belief in our deterioration without reservation. It may be, and, indeed, unquestionably is true, in the case of thousands of our fellow-creatures pent up in close courts, garrets, and cellars, without pure air and water, or knowledge which would lead to an improvement in their condition, and in the case of the thousands born of this class who go to fill prematurely the hospital and the graveyard. But there are other portions of the population of whom a different story may, it is hoped, be told. Still, the destruction of health and life by preventible causes is enormous, and we are again made to feel, by the belief alluded to, the vital necessity of continuous efforts to bring about a better state of things.

Every one may assist in his particular sphere in disseminating knowledge of the kind required, and building up a proper state of public opinion. By the exercise of this alone may we hope to obtain satisfactory laws, and to see those laws properly acted on. The want of education in what affects the human frame,—the operation of the agents by which it is influenced,—is unfortunately almost universal; if it were not so, laws to enforce sanitary requirements would be much less necessary than they are. Sanitary science should be taught to all from the earliest years in schools of every grade. Until this is more generally done, we shall go on, as now, destroying one another, and blind to the fact, obvious to a Latin poet 1800 years ago, that, "Life is not to live, but to be well." This great question of health calls for the primary and unremitting attention of statesmen and legislators; it is far above party considerations, far superior in importance to the great majority of subjects which monopolise attention. Without education and health no nation can advance and be happy, and to bring about those conditions should be the chief object of all government.

THE PRIMARY DEVELOPMENTS OF ARCHITECTURAL DISTRIBUTION.

By an advance that is easy, if not absolutely the most immediate, from the Primary architectural elements of Use and Construction, in the direction of primary combinations, we come to the Apartment: the term must be accepted here in as distinctly technical a sense as it was previously found convenient to assign to the *Beam*. The Apartment, then, taken as the simplest form of architectural arrangement for human haunt or occupation, admits of contrasted forms as Interior or Exterior,—respectively typified by an open platform or a covered chamber. Such a single apartment of either class may constitute a structure in itself; or, with some enhancement of complexity, a structure may be composed, exclusively still, of apartments closed and covered, that have all to be entered as chambers for specific use and enjoyment, or of a set of distributions that quite as exclusively are made up of variously disposed serviceable arrangements, all fully open to the outer and surrounding world.

A public place, esplanade, or piazza, a system of terraces, a ghat,—may exercise the faculties of an architect as seriously as a palace, or a theatre, or a town-hall; and obelisks, monumental columns, ornamental gates, nay, triumphal arches and bridges, may be comprised under the same head of classification. It is not very apparent what more the "lovely-locked Ariadne" could have required for a "chorus"

or dancing-place in "wide-extended Cnossus" beyond a smoothed platform, with some seats, it may be, and, it may be, a podium and ascending steps; yet Homer assigns it to Dædalus, representative of all ingenious artificers, and expresses its formation at first and its imitation by the renowned metal-worker Vulcan on the shield of Achilles, by words peculiarly expressive of care and elaboration. With such a work may be associated, under contrast of the introduction of the vertical element, the Greek Lesche, or lounging-place for the open air, of which the essential characteristic was a wall of such carefully adjusted orientation as to provide a shaded or a sunny side throughout the year, precisely at the times and in due degree when sun or shade were welcome. Further illustrations of this subject will be found in the too short-lived Museum of Classical Antiquities of Edward Falkener. In a *Lesche* for England, the east wind would probably require to be reckoned with at least as accurately as the sun.

As an illustration of structure of most purely interior distribution, what more is required than the dwelling-house, of which too many examples are around us, without porch, area, verandah, balconies, or even parapet?

Half way between structures, so theoretically single in principle, and those which combine both forms, of interior accommodation and exterior also, are the Apartments that similarly may be called Mixed or Equivocal, as scarcely susceptible of division, but partaking equally or in various but marked proportion, of either characteristic; such are platforms partly covered, or chambers partly open or capable of being opened, or closed at will. This class comprehends unnumbered varieties, and among them many of the most beautiful inventions of the architect,—porches and porticos, arcades and loggias, and balconies and vestibules. It is, indeed, in these combinations that the architecture of apartments as exterior has most frequent if not most important scope. The opportunities for the play of proportion are endless here in the details of such apartments themselves; and still further and more important are the responsibilities of consistency and expression involved in the proportions of such apartments, as adjuncts to the mass and distribution of a main building.

The analogies between artistic structures and natural organisation can never be too steadily borne in mind and kept in view, and here present themselves again, and are to be insisted on with especial force; the combination of closed with open distributions,—apartments as technically defined,—corresponds to the union of the "free appendages" of the physiologists,—the attached limbs and branching members, with the central enclosure of walled cavities that constitute the main trunk of the body. In animal organisation we find every variety of proportion in number and extent between these contrasted elements of composition; and Architecture is bound no less to be as harmonious in result, and to establish a parallel proportion that shall be no less agreeable, than consistent with the characteristic purposes of the structure. The open courts and ranges of porticos that enclosed symmetrically the central sanctuary of the temple of Jerusalem, are to be regarded by the architect as they were by the worshippers, as no less parts of the temple; the courts, indeed, are in one place distinctly referred to by Josephus as the "hypæthral temple." The terraced steps and inclines, and open arcades in front of St. Peter's, at Rome, are open "apartments," by no means too extensive to be out of proportion to the vast structure they lead up to, however lacking the last satisfactoriness of articulation with the adjuncts of the main entrance. And on the other hand, the outer balcony above this, that belongs essentially to the same category, and that should naturally have been pronounced with largeness and dignity to correspond with the purpose of its annual ceremonial occupation, lamentably fails. In our own St. Paul's, the dignity and proportion of lateral and western porticos are admirable in themselves,—on the western front especially so admirable, that it must be noted as one of the most wanton sacrifices of rarely realised architectural beauty in Europe that the effect of the graduated approach is utterly frustrate by the interposed screen of heavy railing. Doubtless, if this were to be removed all round, the detrimental weakening of the general basement by the openings perforated to light the crypt, would be unhappily obtrusive; but on the front, at least, the disadvantage would be more than compensated, as well by the giving freely to the eye the full height of the front and its relative divisions, as more especially by fair exhibition of the features that at once express and soften the sense of a transition, that symbolise the intercourse and intercommunion of whatever should be worthy and sympathetic within the consecrated precinct and without. The atrium of St. Ambrogio, at Milan, is an early and admirable adjustment that is but unsatisfactorily replaced by the secluded and unsymmetrical cloister of later cathedral distribution. This is, indeed, a transposition involving questions, not of the design of a single structure, but of the grouping and association of several. A stately entrance to a close is in like manner no more a portion, or development of a portion, of a cathedral, however advantageous an accessory to its dignity, than the *propylon* of a Greek peribolus is a member of the temple it gives admission to. At Athens it will certainly appear that the position and proportions of this detached open apartment were adjusted with studious and ingenious reference to those of the Parthenon; but development proper attaches more closely to its centre.

It has become so habitual, for good reasons, as to seem almost instinctive naturally, for both student and expositor to draw back from the employment of the term Development. It is its lot to share not wholly without cause in the prejudice that attaches to Evolution, so abused of late years as titular of a process that aspires to bring all organic nature forth from whence it assures us at the same time that no germ of organisation ever existed,—to expound the marvel of effects as emergent under no obligation to a cause that is their equivalent, at all. Analysis, however, that aims to be exact, if not exhaustive, must needs be conversant with the process, only more modestly conceived, and may not be quite indulged in a preference for dispensing with the term.

If we commence with the simplest exterior element, a plain platform of whatever dimensions and proportion, it becomes strictly Interior only when surrounded by a wall, and covered by a roof: remove a side, and it appears the equivalent of a porch; remove opposite sides, and it presents the aspect of a Roman tablinum; pierce the roof, and we have the Roman atrium, or an hypæthral chamber; change proportions or absolute dimensions, and the same elements are transformed from the type of a saloon to a hall, to a gallery, to a corridor.

The Pyramids apart, and those only reserved under strict qualification, no structures with claims to the highest and noblest artistic expression were ever more simple in their general scheme than the Greek temples; at the same time that none have ever embodied results of profounder study or finer feeling. In its essential elements a Greek temple is an apartment—a cella—for the preservation and exhibition of a single statue of its god, founded on a basement, and covered by a roof,—this and no more.

The apartment, with few exceptions, and these for the most part only apparent, is uniformly an oblong square on plan, having the entrance at one end, and lighted sometimes by the same opening, in other and more important instances from above, by arrangements of which the difficulty and mystery have surely been exaggerated. Such a distribution is obviously most suitable for the display of a statue, but it is too uniformly adhered to not to warrant the conjecture that it had the sanction of primæval traditions; and if so, like the cruciform plan of cathedrals, it can scarcely have been disconnected with symbolical considerations that might yet be plausibly discoverable. It is, then, the essential simplicity of an important building that should consist mainly of a single chamber, and then only of its simplest and most natural adjuncts, while it claimed and commanded the fullest elaboration of refined art, that makes the Greek temple a most appropriate subject by which to exemplify those general principles—that in virtue of generality and very largeness of application, must also be the simplest—of architectural art.

These structures have the further claim to their position, as marking the true starting-point in history of the architecture of progressive civilisation; the lineage of every style of later date that can claim the honours of a style—even of Indian and Arabian—if traced with accuracy upward, ends at last in these, as certainly as the base-mouldings of shafts at Westminster repeat and own relationship to Ionic bases of Attica. After most liberal reservation made for imperfectly measured and recorded works in Egypt, there remains a gap as marked between what was there done and what in Greece at its very earliest recoverable period, as serious as between Greek poetical mythology and the wearisome Orientalisms which only the antiquarianism of schools, mistaking body for soul, can persuade itself to be not merely earlier, but quite as good,—a chasm as utterly unbridged as between the Fauna of any pair of geological epochs, which it is the tendency of modern science not so much to prove as to induce us to accept, without a particle of substantial proof,—for outgrowths of continuous development.

In the matter of artistic development, the one factor that no analysis can demonstrate to be of necessity, and yet that is all-important, is the manifestation of genius,—the very outbloom of the originating power "of great creative nature,"—in an individual, in a group, in a succession. When this agency has appeared and has done its work, history peers busily and usefully enough into its antecedents and circumstances; yet can but flounder falsely when it presumes to say, as on a time it will, that not only so it was, but so it must have been. This is the element,—the embodiment in one man consummately of the best ideas and tendencies of the time it may be, which still but for that one man would have remained disembodied, or been speedily dispersed, that has been cast in at every great transition of art,—at the genesis of Gothic no less than of Greek architecture, independent utterly of prevenient control or calculation. It was much in this light, to recur to the Philebus, that the critical definition of every noblest art presented itself to Plato,—"A gift of the gods to men, as is very clear to me, sent down to us from some direction by the gods by intervention of some Prometheus, along with a certain most luminous fire; and the ancients who were our superiors, and dwelt nearer to the gods than we do, handed down the tradition" (Plato: Phileb. sec. 18).

The primary oblong plan of the naos,—to return,—is the centre of the development, and controls all proceeding developments and outlines; the application of a lateral portico, as in the Erechtheum, is exceptional; I am told, indeed, that the carving of the elaborate architecture of this north door is so inferior to the exquisite work of the other mouldings, however engravings seem to decline to reduce their own importance by betraying the fact, as to indicate a long posterior date. The primary addition to the typical naos is made by extension of the oblong plan to comprise a porch, or vestibule,—a pronaos,—an open apartment in advance of the doorway, supported by *antæ*, or by columns *in antis*. The result is a temple *in antis*. By advancing the plan still further, and supporting the front by free columns, a portico is obtained in addition to, or substitution of, the pronaos, and the structure becomes a Prostyle temple. In point of use, the portico might supply shelter and shade for functionaries and votaries, as well as for subsidiary sanctities, statues, or other dedications; but its essential contribution to the dignity of the structure is that it withdraws the naos from immediate contact with external accidents, and in a manner secludes it from unprepared intrusion. It is the ceremonious intimation of retirement not idly to be disturbed,—of a blending gradation between contrasted moods of mind. A temple of which the oblong plan comprised such a portico at either end, was called Amphiprostyle; the title, however, does not define the important differences of extent that might exist between the two porticos, and assist with some other adjustments to render the proper front unequivocal.

The next and a most important development is the extension of the roof, not only endways to shelter a portico, but laterally to cover wings or external ambulatories, between the walls of the cella and a row of columns that return the line of those of the porticos, and so complete a peristyle;—the temple so enhanced acquiring the character and name of Peripteral.

Sometimes more rows of columns than one were applied on the flanks, and more than two on the fronts; and in peculiar cases,—a remarkable and important example is among the at present unpublished archives of the Society of Dilettanti,—the plan was spaced as for a double row, but the interior line was omitted on the flanks at least, or entirely.

The little temple of Themis at Rhamnus, in Attica, is a simple oblong nave, extended by a portico, distyle *in antis*; that is, with a roof supported by two columns, between piers, that terminate the produced lateral walls of the cella.

In the little temple of Artemis Propylæa, at Eleusis, we find the same arrangement, with the addition of a similar portico,—distyle *in antis*, at the rear as well as front of the structure.

In the plan of the Ionic temple on the Ilyssus, free columns take the place of the antæ, which are set back behind them, and there results an Amphiprostyle plan.

The plan of the temple of Nemesis at Rhamnus, of that of Theseus at Athens, and of many others, is the plan of the temple of Artemis Propylæa, surrounded by a general peristyle that envelopes it front and flank. In these larger temples, the cella, with its porticos and proper basement and step, is placed upon a larger general platform or basement, of which the lateral extensions form the stylobate that bears the columns of the peristyle; and cella, porticos, and peristyle are covered by the general span of one common roof.

The plan of the majestic Parthenon exhibits an Amphiprostyle cella—which, however different in proportions, is still of the same class and nature as that of the temple on the Ilyssus; that is to say,—each portico consists primarily of a row of columns in advance of the antæ which have no columns placed between them; the difference in the projection of the antæ in the two cases respectively is matter of proportion,—a more essential difference is the division of the cella by a cross partition into two unequal chambers, each with an entrance from its proper portico.

Here, again, the amphiprostyle cella has its proper steps and basement, and stands therewith upon a larger and deeper basement that bears the outer colonnade;—colonnade or peristyle and cella being comprised, as in all instances, under the double slope of one common roof. The scanty remains of the temple of Jupiter Olympius at Athens are sufficient to disclose that here the flank colonnades were double, and that by a still further application of the same rule of distinction there was a descent of a step from the inner to the outer stylobate.

And so the simplest possible fundamental architectural scheme was extended successively by the simplest possible modifications, yet withal the most significant, of rudiments first, and then of members already existing,—their duplication and reduplication. At the same time, the primary generative notion was never confused, covered up, or superseded, any more than in the marvellous development of the spoken language of the architects, was the value of a primary syllable obscured by accretions of syllable on syllable that clustered around it, each contributing a restricted but special significance, each taking its place with pathological sensitiveness of harmonious collocation, and altogether making up at last a fully inflected and expressive word controlled in pronunciation by one dominating accent. The architectural language of the Greek grew under observance of the same laws as his spoken language, and his poetical materials and forms; barbarism and discordance may lie buried at the roots, and ethnologists may dig and find them there, or trace that there they have been, but they were only ever to be found there at all to become rapidly refined almost beyond recognition by industrious and sagacious study, by enthusiasm for Beauty, and reverence for the Truth that lives in the eternity of Nature.

SANITARY PRINCIPLES OF SCHOOL CONSTRUCTION.

Now that new school-boards are preparing for the construction of new school-rooms, it is of importance that they should be apprised of the sanitary defects that require amendment in the greater proportion of those existing for the elementary schools in this country. Medical officers of health have concurred in declaring that the common elementary schools, as now constructed and conducted, are the frequent centres of childhood epidemics. An excess of upwards of 7,000 deaths in the metropolis, and of upwards of 50,000 annually throughout England and Wales, in the school stages of life, were pronounced by them, on the observation of the working of particular schools within their province, to be largely attributable to the structural condition of the school-rooms, and to the modes in which the children are kept in them.

The chief sanitary defects of these schools are, in my view—1. Defective ventilation; 2, Defective warming; 3. Bad drainage and foul latrines; 4. Want of means of enforcing personal cleanliness; 5. Bad lighting; 6. Bad arrangements of desks and seats; 7. Want of proper means of gymnastic exercises; 8. Insufficient, and ill-paved playgrounds. I would submit that it is important that school-boards should require, in the competition for plans, that these evils should be first specially considered and provided for, and that the architectural designs and elevations be made of secondary consideration.

I will, in the first place, treat of the warming of the schools, as that largely influences their ventilation. To me, it has always been most painful to observe the condition of children in winter-time in the common schools, going there in cold and wet, in driving sleet and snow, frequently ill-shod, and commonly ill-clothed,—kept in the school with feet and hands painfully cold, fingers often so benumbed as to be scarcely able to hold their slates and pencils; the open fires at one end of the school, not freely to be approached, and when approached, the warming or heating on one side, "roasting in front and freezing behind," so as to give inflammations or colds from the disturbed and unequal circulation. The confinement of the children for five or six hours in such conditions, overtasked mentally, and painfully constrained bodily, are surely evil conditions, requiring active intervention for their relief. One consequence of the defective warming is, that doors and windows are shut to keep out the cold. Then comes the pernicious effect of confinement of the children in the atmosphere polluted by their breath and by transpiration from their skins, usually unwashed, or only hands and face washed, and from dirty clothes. As a relief, some of the windows are in part opened, and the cold air is let in for ventilation. The corners where this is done have been called "rheumatism holes." Sometimes, when the windows are kept closed, the confined air is heated to an extent that creates perspiration, even in winter-time. Eruptive diseases are often consequences of precedent functional derangements, and when there are outbursts of epidemics in children's institutions or in large schools, they frequently occur among the children grouped at one end, and the first case observed is a new comer, who has been for a time the centre of the group attacked, the infected breath having been pumped out upon the surrounding children for several days before the eruption has appeared on the new comer. In general hospitals, it is known, that if they are well ventilated, cases of typhus fever may be put in every second or third bed, with an interval of about 4 ft. between each bed. Cases of scarlatina, it is considered as settled, must be placed at wider intervals—as of every seventh bed,—but if the ventilation be defective and confined, a foul atmosphere is created which will endanger the nurses. I submit that the first object is to improve the method of warming as involving the method of ventilation.

Of the modes of warming, those by hot-water pipes and iron surfaces are of inferior, and sometimes, when for high heats, are of pernicious effect, and are very expensive. Besides, they are apt to warm only the sides of rooms, or the upper parts of them, and to leave the feet cold, unless an inconvenient and objectionable degree of heat is created over the whole room.

Observing some ragged boys at night grouped upon a particular street-pavement, and apparently enjoying themselves, in very inclement weather, I found that the pavement on which they were assembled was warmed by a baker's oven beneath. It is observable that market women, with a foot-warmer, sustain very inclement weather. The like facts, which I might multiply, appear to me to lead to the conclusion that there are no means of applying warmth that are so economical as by applying it to the feet. There is extending experience of this in the use of hot-water bottles, and vulcanised-macintosh hot-water bags.

The class of facts on this topic lead me to recommend that we should adopt the practice of two empires, of Rome and of China.

The ancient Roman plans of floor-warming are displayed in the remains of villas found in the chief seats of their occupation in this country. Their hollow floors were mostly made by square slabs of stone, or of large tiles, supported by stone pillars 1 ft. or 8 in. high, or more, set upon a lower stone floor. The upper floors were covered with concrete, and often ornamented by tesseræ. Some of their hollow floors in this country were evidently warmed by coal, from the remains of coal soot: in others they were warmed by wood. The fireplace was, from the coal-warmed flooring, mostly a small cylinder of red earthenware, containing a mere hatful of coal, through which the air was led by a down-draught through the hollow of the floor, the draught being created by an upcast flue on the side of the chamber opposite to the fireplaces, the tall chimney-flue acting as the longer leg of an inverted syphon. In some of the largest Roman constructions of this species, the heat appears to have been led underneath the long, distinct channels. But in some the warming was by the diffusion of heat through the floors, amidst the uprights, which, I conceive, would be done by low heat, led slowly, but long applied.

I have been unable to get any detailed accounts of the Chinese methods of construction for the purpose, but the testimony is strong and decided that the floor-warming there is the most comfortable that has been experienced by Europeans. Marco Polo, the early traveller, notices it as extraordinary. The warming is effected with a comparatively inconsiderable amount of almost any sort of fuel. I am informed that in the barracks in China, constructed on the English principle of the open fires men were frost-bitten, whilst the Chinese, with their mode, were perfectly unharmed. The abuse of the method of warming will obviously be in getting up unduly high heats for the whole of the air of a room. The warmed floor, in its proper use, however, appears to me to have the peculiar advantage of enabling a colder and thence more condensed air, a better quality of air, to be breathed than any heat-expanded air.

To those who have not had occasion to attend to the subject, it may be observed that if a given quantity of air, with a given quantity of oxygen, at a given temperature, be expanded in bulk by heat,—say a fourth,—the inspirations of the lungs must be quickened in proportion, to obtain in the same time the same quantity of oxygen. In newly warming the Palais de Justice, at Paris, a warmed surface was placed for the feet of each judge. If the warmth were applied to the whole body so as to raise it to the same temperature given by the foot-warmer, the air breathed being more expanded would, I consider, be inferior in quality for the health. It is proper to mention, as respects the higher class of female schools, boarding schools, great pain is inflicted, and bodily disorder occasioned, by heads kept heated by unduly protracted mental labour, and feet kept cold by bodily inaction.

Before it became a practice to use foot-warmers in railway-carriages, the passengers were accustomed to close the windows as completely as they could. Since foot-warmers have been introduced windows are allowed to be more widely opened.

The effect of foot-warming is, then, to enable the body to sustain, with less discomfort, the impact of cooler currents of air. Foot-warming will of itself allow of doors and windows to be opened with less annoyance, and of itself will be conducive to freer ventilation. But in addition to the warmed floor I would propose the introduction of open fireplaces, on Captain Galton's principle of warming with air pumped in that is fresh, as well as warm, and the more active removal of vitiated air through the smoke-chimneys. I have long advocated the principle of floor-warming; but I find it expedient to propose particular means for the purpose, as architects will not be at the pains to study the Roman methods of floor-warming.

I will now describe the tile and the support, with which I propose to effect the object efficiently and economically.

The tile forming the hollow floor may be of concrete, or of earthenware, or of slate, to be tongued or rebated at the sides, so as to fit into each other, and, when cemented, not be easily shifted, or so as to obstruct the passage of highly-warmed air or smoke, if accidentally loosened. The upright supports are made with tongues to lock in at the corners of the tiles.

The tile and the support used as a cross-tie will, I submit, serve for the construction of walls, and attain more perfectly the sanitary ends I proposed for the hollow brick construction of the walls of houses. It may also be used for roofs as well as walls, in which case iron ties are to be used to give it cohesion, and iron uprights for bearing-power, on the Crystal Palace principle. If walls of ordinary construction be made with non-absorbent surfaces, there may be sometimes unpleasant condensation on such surfaces, because they will be sometimes colder than the dew point of the air. If, however, contact of the outer air with the inner part of the wall be prevented by the interposition of a layer of confined air, the inner surface of the wall will never be much colder than the air of

the room, and will not, therefore, condense moisture from it. The inner glass of double-paned windows does not become covered with hoarfrost for the same reason, the inner pane being nearly as warm as the inner air; it remains clear when common panes are obscure.

The tiles for this purpose may be made of earthenware as well as of concrete, but most cheaply of concretes which require no burning, and most readily receive exactitude of form. With about 1-6th or 1-7th of good Portland cement, or with General Scott's new preparation of lime clay and sand, called *celenite*, tiles and the supports may be made stronger than the common building stones. For leading the warmed air in any direction, and better diffusing it on admission, in place of the upright pillars, upright tiles with rebated joints may be used.

In some cases, in the place of tiles with rebated joints, tiles with overlap joints may be found eligible for the application of rapid second mechanical vertical pressure in construction.

The concrete tiles may be moulded in the yard, and kept to harden there, and to be tested there, and then carted to the spot and be set up rapidly, without any other mechanical process there. The advantage of the tile construction of walling is, that with the cross-ties included, not above one quarter of the material will suffice to give the requisite strength. Only one quarter of cartage and expense of conveyance is required, and the total expense of the construction, iron supports and cross-ties included, is less than the common cost of construction.

If earthenware tiles are used, they pack closer in the kilns, and closer and lighter for carriage than any solid materials. The form and construction of the tiles gives them the maximum of strength, of density, and non-absorbency or dryness, with the minimum of material and of weight. Some of the advantages of the hollow wall construction of tiles, in respect to non-conductibility of heat, are like those of the double window,—they will be cooler in summer and warmer in winter.

One advantage of the tile construction is, that from the very considerable saving which the plan effects in the *material*, a proportion may be given to the improvement of the tile. Its flat shape admits of power being applied at a ready and cheap rate by a second pressure when the material is half dried, to give it great density of substance and exactitude of form. With this second pressure they may be made absolutely non-absorbent, and to throw off driving wet as well as ascending wet, and may be made absolutely damp-proof. The inner tiles would be washable on the surface,—in itself an important sanitary quality. They may be coloured of any colour that may be deemed suitable, and that with a great economy over the usually unwashable paper and absorbent plaster. By these means the warming and, indirectly, the ventilation, may be most cheaply and efficiently provided for.

A better conception of the eligibility of the principle of construction proposed will be obtained by examining and considering the specimens of the tiles, rudimentary as the specimens produced yet are. The ends might, and the chief advantages claimed for them may be thus summed up:—Giving maximum of strength of each tile, with the minimum of material; a maximum of defensive power for shelter and durability at a minimum of cost; a cheap and salubrious means of diffusing warmth in winter, and of defence against excessive heat in summer; non-absorbent and washable interior surfaces, defensive against vermin and noxious deposits; means of cheap and permanent washable colouring and ornamentation; facility of transport; rapidity of construction and alteration; cheap, and dry, and smooth surfaces for play-grounds. In the selection of materials for the tiles, those of the greatest non-conducting power are, of course, to be preferred. The common tiles and bricks, being usually absorbent of moisture, are rapid conductors of heat, and when we were consulted at the General Board of Health we advised that they should not be allowed, but only wood for the floors of schools, inasmuch as the common tiles, instead of giving warmth *to* the feet, aggravated the evil in question by taking warmth *from* the feet. I take it that the foremost authority on ventilation, from the long and impartial attention he has paid to it, and the trial he has conducted, is my colleague of the Institute, General Mervin, and he has given decided testimony on trials in favour of Captain D. Galton's warming and ventilating chimney. I propose to submit to the General for his opinion this method of floor-warming, as to the modifications it may require in connexion with that important instrument, the chimney-ventilator, which I have got successfully applied in some model cottages.

* * * *

There is a very frequent and serious defect in the construction of the common schools which requires to be guarded against,—namely, the bad distribution of light. From a paper transmitted to me by the excellent sanitarian, Dr. Varrentrapp, of Frankfort, it appears that from the insufficiency of light, and from the bad division of light, in the schools in Germany, nearly a third of those who remain in them during and beyond the secondary stages, are subjected to short-sightedness. Professor Leibrich, our most eminent oculist, tells me that the injury is always done by the front light, and that the light should always be got in from the left side, and that in towns where such light cannot be obtained, it should be got, as the next best, from the back of the desk, and never from the front. A great deal of distortions and curved spines are, as Dr. Varrentrapp shows, occasioned by the wrong adjustment of seats,—a topic, as well as others, of the wall colourings and school-fittings, beside my immediate purpose. I consider that schools ought to have more of window-space; of windows made with very thick glass, which is economical as saving heat, and is, moreover, advantageous, as saving the transmission of sound from the streets.

Enough has been stated to show that the school, properly considered as an efficient implement for training the young, is not the mere barn with an architectural elevation, according to the common conception, but, for the avoidance of serious evil, as well as for the attainment of the requisite good, is an implement which must be carefully fashioned by the best practical sanitary science.

EDWIN CHADWICK.

THE IMPROVEMENT AND PROVISION OF HUMAN HABITATIONS.

LEEDS CONGRESS OF THE SOCIAL SCIENCE ASSOCIATION.

In the Health Section, Dr. Acland, of Oxford, read a paper entitled, "The Sanitary Care of Villages and Cottages." In the course of it, he said that, *mutatis mutandis*, the same sanitary care should be bestowed on a cottage in the country as on a house in a town. In the case of a well-ordered town, the community provides water for its members, and removes their refuse for them. Not so in a village. The chances are in many districts that every cottage or every other cottage has its well; and, there being, of course, no sewers, has its own cesspool. The expense and the risk from want of organisation are both multiplied. It may be said that our scattered populations are not worth the care, or that, if worth the care, then the supervision would, in practice, be too costly: so that the care of hamlets and villages is either impracticable or visionary. Issue may be joined on both these objections. The rural populations are becoming nurseries for town populations. They cast into the towns either a strong, decent, manly people, or an enfeebled progeny, brought up unwisely. The rural districts contain no less than 9 803,811 persons, having increased in the last ten years by 668,428. With respect to the purely rural districts, the great powers of the Public Health Acts at present reside with vestries and guardians. In many cases, therefore, they are indirectly in the hands of the very class of persons who require guidance and help. Herein lies a great part of the strength of the Local Government Board. It enlists in the cause of public health, understood in the widest sense, every ratepayer who votes on matters of parish organisation, and the medical men of the poor. Will they act? Will they apprehend their own material interests. We may not doubt that, with the progress of education and self-government, they will. What has to be done in these difficult cases must often, I am convinced, be done by the people, with the aid, but not by the compulsion, of the law. To revert to the specific proposition from which I started,—the cottages in rural districts should be scavengered by the community and not by the occupier.

A second paper on the same subject was read by Mr. P. H. Holland, and a discussion followed, in the course of which

Dr. Stallard objected to the principle of amending private property at the public cost. He regarded the experiment that has been made at Liverpool as a most lamentable failure. At no time had Liverpool been in a more unhealthy state, and never less free from epidemic diseases than within the last two years, notwithstanding all the money that had been expended. He did not therefore think that the evil should be remedied in that way. A law was already provided for the destruction of houses unfit for habitation. But there were two parts of this problem. The best house might be made unhealthy by the habits of the occupant; and at the same time it must be borne in mind that the very worst roof in the country could be made decent and comfortable by the habits of those occupying it.

Mr. G. W. Hastings commented on one of the topics referred to by Dr. Acland, viz.,—as to who are the persons to be charged in rural districts with the execution of this work. Where he lived he had painful evidence not only of the evils of the present system, but what would be the evils if the system which the Sanitary Commission was attempting to carry into effect were adopted. He pointed out the faults of the present system, and said the only chance they had of an improvement with regard to the sewerage, the supply of water, &c., was by having an authority acting over large areas, and, therefore, not coming into contact with some neighbouring authority.

Mr. Rawlinson, C.B., speaking from a statesman's point of view, said that the question of providing the best form of dwellings for the people had been neglected, so far as his knowledge went, from the earliest dawnings of history. He knew of no nation that had paid attention as it ought to have done to the dwellings of the lower class population. He spoke with a full knowledge of the habitations of this country, and he spoke also with some knowledge of the houses of the labouring classes upon the Continent and even in America and India; and the sum total of the story was one of utter and gross neglect,—one which generates a mass of misery, crime, and disease that was indescribable. That being the case, whether socialism was to come into play, whether the rich were to take something from their wealth to aid the poor, he was not there to tell, or to speak of the form in which the work should be done. He was simply there to say that there was no safety for any State; that there was no safety for any people; and no security for any Government, until statesmen have learned that lesson and worked out the problem how it is to be applied. He would point out what had recently taken place in France. What had impressed upon the people of that country the untruthfulness of character which they possessed? They must attribute it to the gross ignorance in which the people revelled. Statesmen knew they could tell them any number of lies, because they knew no better. But raise that population, give them proper dwellings to live in, educate them, give them freedom, and no statesman would dare to tell them those falsehoods. As to the question of securing the best dwellings from the building point of view, one of the great evils in the construction of houses in this country was, first of all, utter regardlessness of the site, the subsoil, the material, and the mode of management subsequently. Now, if they were going to build a house for themselves, whether a ville, a mansion, or a palace, the first necessity was to have a dry subsoil. If not naturally dry, it must be made so. The second necessity was that the area must be isolated from the subsoil, and the best and cheapest means to accomplish that was to use concrete. Then they ought next to put in a damp-proof course, either made of brick or of stone, which was not costly. If they had a basement story, they ought as much as possible to isolate it from the ground. Make a dwarf wall around it, and keep off the damp from the basement walls. Then the rooms ought to be arranged to secure ventilation. Going afterwards into details, Mr. Rawlinson made some very complimentary remarks with reference to the *Builder*.

In the Economy and Trade Section, on the question, "Is it desirable that the State or Municipality should assist in providing improved dwellings for the lower classes; and if so, to what extent, and in what way?" a paper by Mr. James Hole, was read. At the outset it referred to the great deficiency in the accommodation for the poor, and after commending building societies, which, however, did not meet the deficiency, he referred to the two Acts passed in 1851 and 1866, the one to encourage the establishment of lodging-

houses by the authorities, the other to enable the Public Works Loan Commissioners to lend capital to erect improved dwellings for working men. He approved of the principles of those Acts, but contended that the capital lent by the State should be advanced at a lower rate of interest, and that a much larger proportion of the cost of the improved dwellings should be advanced. He recommended that the scale of repayment should be so constructed as to enable those who wished to become owners of their own dwellings, and illustrated the principle of the experiment made by the Model Cottage Society of Leeds a few years ago.

Mr. T. B. Smithies, the excellent editor of the *British Workman*, read the next paper on this subject, and referred chiefly to the shocking crowded state of the dwellings in London, and the fact that with the carrying out of great railway improvements, masses, equal to the population of large county towns, had been turned out of their dwellings, without any home, in many cases, whither they could go. He stated that Prussia had for years devoted itself to the improvement of the dwellings of the poor, and considered that England should do the same, and see if it was not practicable that the Waterlow and Peabody schemes could be extended in the most populous parts of London, and that if they could not get little cottages with gardens, why could they not adopt the Scottish system of holdings or flats?

Mr. Burnham Safford also read a paper upon this subject. He considered the scheme of preventing typhus spreading by the establishment of wholesome dwellings and the starting of an industrial dwellings company, was creditable to the town of Leeds. If intemperance was the origin of vice, idleness, and crime, so also were, surely, hovels devoid of sanitary and other comforts the origin of intemperance. Physical and spiritual degradation followed one upon another, and consequences unnatural to the ordinary state occurred, and we had the "descent of man backwards." Means for procuring improved dwellings having been provided by the Labouring Classes and Dwellings Act, 1866, it only remained for the Legislature to prevent a good measure from becoming virtually a dead letter.

In the course of the discussion which followed, Mr. Daglish, of Newcastle, said that the Newcastle Improvement of Dwellings Company had declared a dividend of 5 per cent., after putting by a fund equal to 10 per cent. upon the whole capital for depreciation in value. He felt certain 8 per cent. could be realised upon workmen's cottages, and while that could be done there was no need to go to the State for aid. If proper care were exercised, workmen's dwellings could be made to pay. He asserted that the State had already given sufficient and necessary assistance in this respect, and he disapproved their going to the State to borrow money. As to the question of the municipality assisting the erection of such dwellings, he thought they could not well do so, as in many cases members of corporation felt they were coming into competition with private enterprise. This difficulty had been experienced in Newcastle, and the work had been left to private enterprise.

Dr. Gairdner, of Glasgow, said there were, in his mind, great difficulties in the way of the State or the municipality building houses for the working classes in the room of those displaced by improvements. It would, he said, be wrong for the municipality to build a similar class of houses to those displaced. In illustration, he said, in the city of Glasgow there were 100,000 houses, 25,000 of which were occupied by persons at a tenancy below what it was possible to construct or hold an ordinary dwelling. The majority of them were below 5*l.*, some even 4*l.* 10*s.*, 4*l.*, and even 3*l.* It was impossible to get any place to accommodate a family with anything like comfort, even if it were only one room, under 5*l.* Supposing some great commercial operation should displace a number of these houses, was the municipality to replace them with a similar class of houses, a class below the line of sanitary comforts? For if they were not to do so, they could not replace those houses thus removed. The working class of Glasgow had become so debased by the evil influence of miserable dwellings that they could not rise to the idea of proper house accommodation. The remedy for removing the present low class of houses was to let the working classes understand that they must raise their notions of accommodation. If such a class knew that the municipality would provide dwellings for them, there would be no end to it. The duty of the municipality was, rather than assist in erection, to destroy these dwellings as rapidly as possible. They should remove them as rapidly as possible, but he would recommend a gradual process. Much had been said as to the advantages of the flat system. He admitted there was a great convenience in it, but there was danger in it. The danger was this,—it accommodated a large population upon a small area, and this led to the generation and increase of fever. If they adopted this system, they must do it upon a conditional system. He concluded by repeating that it was the duty of the municipality to pull down the low class of houses as quickly as possible.

Ultimately the following resolution, moved by Mr. John Holmes, Leeds, seconded by the Rev. H. Solly, was passed:—

"That the Section recommends the Council to take into its consideration what legislation can be taken to improve and render more effective the Public Health Acts, giving power to close or remove property found unfit for habitation; and, further, by what means statistical information could be obtained as to the experience of the various companies, societies, or other organisations which are engaged in providing dwellings for the working classes."

THE HEALTH OF OPERATIVES IN FACTORIES AND WORKSHOPS.

In the Health Department at Leeds, on the special question for discussion, "What are the best means of promoting the health of operatives in factories and workshops?" the first paper was read by Dr. J. H. Stallard, who said the chief point was to keep the air-supply pure; and he maintained that the death-rate and the kind of disease existing proved that the air in many cases was impure. A sufficient supply of air was capable of reducing the deaths resulting from pulmonary disease, and this fact he illustrated by a reference to improvements that have taken place in barracks to secure ventilation. He wanted, he said, to establish the principle that factories and workshops should be so constructed as to assimilate the condition as near as possible to that of the open air, with provision only for protection against rain falling and violent draughts. To protect ourselves from draughts and rain was all that we really required. All ventilation proceeded under the supposition that only a certain amount of air was required, whereas the true air-supply we needed was only to be obtained by living in the air. He exhibited a diagram of an improved method of ventilating hospitals, public buildings, and dwelling-houses, and in speaking of it said that if we wanted to place our workshops in free contact with the open air, we should be compelled to adopt the principle of numerous small openings, and must rely upon the laws of diffusion and connexion for a sufficient and complete interchange. That was, we must protect our apartments from the direct pressure of the wind, and yet provide a large surface with which the communication with the outer air should be free. Laws of diffusion and connexion were sufficient to insure interchange even in the stillest atmosphere, if only we gave them sufficient opportunity for acting; and the problem was thus reduced to the question as to the largest surface of our room sides, which might be perforated by innumerable small openings, so placed as to be free from any outside pressure of the wind. Of course we could not perforate any of the sides, and we had only the top and the bottom. It would be expensive and difficult and useless to perforate the floor, and thus we were driven to the alternative of perforating the ceiling. If we protected this perforated ceiling from rain, and exposed it nowhere to the direct pressure of the wind, we had succeeded in placing the workroom in free, complete, and immediate contact with the outside air, and we should have given the principle of slow diffusion full play. No great volume of cold air could possibly be driven down on any side of the apartment, whilst the freest exit was provided for the warm and vitiated exhalations from the lungs and body, and for any unwholesome products of the manufacture carried on. There was no disturbance in the atmosphere of the room sufficient to interfere with the natural rising of the vitiated products to the ceiling, and in the plan he had proposed there was nothing to prevent the escape of those products into the air chamber, from which they were at once carried away by the horizontal current passing through. The arrangement was simple. Every room should be provided with a double ceiling, the space between being in free communication with the outer air on all sides. The top ceiling was either the floor of the room above, or the roof—the lower ceiling was made of finely perforated zinc, or oiled paper. The air chamber should be large enough to admit of being swept out from time to time, and the sides might be made of perforated bricks of various colours and shapes. This plan did not interfere with the employment of opposite windows and ordinary means of warming rooms. The sole object was to maintain the principle of living in the open air, under all conditions, whether in winter or summer, day or night. It was beyond the control of any one to cut off the wholesome and necessary connexion. It was a principle which, in his judgment, was as necessary in a bed-room as in a drawing-room, and as necessary in a factory as in a hospital. It was a principle which had been ignored by architects since the Roman era, but he would observe that the courts of the Pompeiian house were but a more open arrangement than the one proposed. He believed that the best means of improving the health of operatives in factories and workshops would be to place them in direct communication with the open air by the plan proposed.

In discussion, Mr. Leighton (Liverpool) said, the simplest and most effective system of heating and ventilating he had ever seen was in a schoolroom at Glasgow. The whole of the exhausted air was taken away by the draught caused by a fire on the lower floor, the school being on the second floor, and the air being conveyed to the lower room in a tube from the ceiling. The supply of fresh air was by means of a perforated pipe, which pipe conveyed the air to a boiler heated by the fire, and there the air was warmed and conveyed back to the schoolroom.

Mr. Rawlinson recommended the suggestions of Dr. Stallard to the serious consideration of all persons having anything to do with men crowded either into workshops or into houses. There was no artificial remedy, there was no fine-drawn remedy of flues or valves or other means of that class that would give fresh air in the abundance that appeared to be necessary for health.

THE AUTOBIOGRAPHY OF MR. RUSKIN.

Mr. Ruskin has made public the following autobiographical notes:—

"You perhaps have been provoked in the course of these letters by not being able to make out *what* I was. It is time you should know, and I will tell you plainly. I am, and my father was before me, a violent Tory of the old school (Walter Scott's school, that is to say, and Homer's). I name these two out of the numberless great Tory writers, because they were my own two masters. I had Walter Scott's novels and the Iliad (Pope's translation) for my only reading when I was a child, on week days: on Sundays their effect was tempered by 'Robinson Crusoe' and the 'Pilgrim's Progress,' my mother having it deeply in her heart to make an evangelical clergyman of me. Fortunately, I had an aunt more evangelical than my mother, and my aunt gave me cold mutton for Sunday's dinner, which, as I much preferred it hot, greatly diminished the influence of the 'Pilgrim's Progress;' and the end of the matter was, that I got all the noble imaginative teaching of Defoe and Bunyan, and yet—am not an evangelical clergyman.

I had, however, still better teaching than theirs, and that compulsorily, and every day of the week. (Have patience with me in this egotism; it is necessary for many reasons that you should know what influences have brought me into the temper in which I write to you.)

Walter Scott and Pope's 'Homer' were reading of my own election, but my mother forced me, by steady daily toil, to learn long chapters of the Bible by heart; as well as to read every syllable through, aloud, hard names and all, from Genesis to the Apocalypse, about once a year; and to that discipline—patient, accurate, and resolute—I owe not only a knowledge of the book, which I find occasionally serviceable, but much of my general power of taking pains, and the best part of my taste in literature. From Walter Scott's novels I might easily, as I grew older, have fallen to other people's novels; and Pope might, perhaps, have led me to take Johnson's English, or Gibbon's, as types of language; but once knowing the 32nd of Deuteronomy, the 119th Psalm, the 15th of 1st of Corinthians, the Sermon on the Mount, and most of the Apocalypse, every syllable by heart, and having always a way of thinking with myself what words meant, it was not possible for me, even in

the foolishest times of youth, to write entirely superficial or formal English, and the affectation of trying to write like Hooker and George Herbert was the most innocent I could have fallen into.

From my own masters, then, Scott and Homer, I learned the Toryism which my best afterthought has only served to confirm.

That is to say, a most sincere love of kings, and dislike of everybody who attempted to disobey them. Only, both by Homer and Scott, I was taught strange ideas about kings, which I find, for the present, much obsolete; for I perceived that both the author of the 'Iliad' and the author of 'Waverley' made their kings, or king-loving persons, do harder work than anybody else. Tydides or Idomeneus always killed twenty Trojans to other people's one, and Redgauntlet speared more salmon than any of the Solway fishermen, and—which was particularly a subject of admiration to me—I observed that they not only did more, but, in proportion to their doings, got less than other people,—nay, that the best of them were even ready to govern for nothing, and let their followers divide any quantity of spoil or profit. Of late it has seemed to me that the idea of a king has become exactly the contrary of this, and that it has been supposed the duty of superior persons generally to do less, and to get more, than anybody else; so that it was, perhaps, quite as well that in those early days my contemplation of existent kingship was a very distant one, and my childish eye wholly unacquainted with the splendour of courts.

The aunt who gave me cold mutton on Sundays was my father's sister: she lived at Bridge End, in the town of Perth, and had a garden full of gooseberry-bushes, sloping down to the Tay, with a door opening to the water, which ran past it clear-brown over the pebbles three or four feet deep: an infinite thing for a child to look down into.

My father began business as a wine merchant, with no capital, and a considerable amount of debts bequeathed him by my grandfather. He accepted the bequest, and paid them all before he began to lay by anything for himself, for which his best friends called him a fool, and I, without expressing any opinion as to his wisdom, which I knew in such matters to be at least equal to mine, have written on the granite slab over his grave that he was 'an entirely honest merchant.' As days went on, he was able to take a house in Hunter-street, Brunswick-square, No. 54 (the windows, of it, fortunately for me, commanded a view of a marvellous iron post, out of which the water-carts were filled through beautiful little trap-doors, by pipes like boa constrictors; and I was never weary of contemplating that mystery, and the delicious dripping consequent); and as years went on, and I came to be four years old, he could command a post-chaise and pair for two months in the summer, by help of which, with my mother and me, he went the round of his country customers (who liked to see the principal of the house his own traveller); so that, at a jog-trot pace, and through the panoramic opening of the four windows of a post-chaise, made more panoramic still to me because my seat was a little bracket in front (for we used to hire the chaise regularly for two months out of Long Acre, and so could have it bracketed and pocketed as we liked), I saw all the high-roads, and most of the cross ones, of England and Wales, and great part of Lowland Scotland, as far as Perth, where, every other year, we spent the whole summer; and I used to read 'The Abbot' at Kinross, and 'The Monastery' in Glen Farg, which I confused with 'Glendearg,' and thought that the *White Lady* had as certainly lived by the streamlet in that glen of the Ochills as the Queen of Scots in the Island of Loch Leven.

It happened also, which was the real cause of the bias of my after-life, that my father had a rare love of pictures. I use the word 'rare' advisedly, having never met with another instance of so innate a faculty for the discernment of true art, up to the point possible without actual practice. Accordingly, wherever there was a gallery to be seen, we stopped at the nearest town for the night; and in reverentest manner I thus saw nearly all the noblemen's houses in England; not, indeed, myself at that age caring for the pictures, but much for castles and ruins, feeling more and more, as I grew older, the healthy delight of uncovetous admiration, and perceiving, as soon as I could perceive any political truth at all, that it was probably much happier to live in a small house, and have Warwick Castle to be astonished at, than to live in Warwick Castle, and have nothing to be astonished at; but that, at all events, it would not make Brunswick-square in the least more pleasantly habitable to pull Warwick Castle down. And, at this day, though I have had kind invitations enough to visit America, I could not, even for a couple of months, live in a country so miserable as to possess no castles.

Nevertheless, having formed my notion of kinghood chiefly from the Fitz-James of the 'Lady of the Lake,' and of noblesse from the Douglas there and the Douglas in 'Marmion,' a painful wonder soon arose in my child-mind why the castles should now be always empty. Tantallon was there, but no Archibald of Angus; Stirling, but no Knight of Snowdoun. The galleries and gardens of England were beautiful to see; but his lordship and her ladyship were always in town, said the housekeeper and gardeners. Deep yearning took hold of me for a kind of 'Restoration,' which I began slowly to feel that Charles II. had not altogether effected, though I always wore a gilded oak-apple very reverently in my button-hole on the 29th of May. It seemed to me that Charles II.'s Restoration had been, as compared with the Restoration I wanted, much as that gilded oak-apple to a real apple. And as I grew older, the desire for red pippins instead of brown ones, and living kings instead of dead ones, appeared to me rational as well as romantic; and gradually it had become the main purpose of my life to grow pippins, and its chief hope to see kings."

INFORMATION FROM CANADA.

Sir,—I have been five years away from England, and during that time, having travelled nearly the whole of Canada and in the Western States of America, I perhaps may enlighten the "artizans" likely to emigrate as to what they may expect in coming to Canada or America. I will not touch wages in this letter, but speak of the classes most likely to prosper.

1st. Carpenters and joiners are a class most likely to succeed. In the first place, they will have a different kind of work to do than what they have been used to. Throughout Canada, and in most parts of the States (except large cities), the carpenter is the mainstay of building. Nearly every house is executed in framework,—very little brick or stone, and very few hands from England are accustomed to it. Carpenters should thoroughly study theoretically how to frame a building, or else they will find themselves a long way behind the "American" artizan. Let them study by plans, so as to cut up and make everything fit, so that it can be fixed and put together, as it were, like a bedstead. The interior parts of buildings are not so much studied, but a *good English workman* can go ahead, *and when it is to be done* will always have the preference of a job. Staircase and handrail hands are at a premium when that kind of work is wanted; and, with architectural and mechanical schools in England, they should be able to get out the lines, and be able to undertake such work. It nearly in every case is done by contract, and pays well.

2nd. Bricklayers, from the shortness of the season, can only depend upon five or six months' full work in the year. Very few follow this trade, but act as masons, laying stone for cellars and kitchens, generally executed as far as the level of the ground-floor: with care and economy, and by going to the right places, they may do very well.

3rd. Slaters are useless; nearly every house is "shingled," or tin-roofed. Slates do not answer, from the severe frosts and heat.

4th. Plumbers used to job work, gas-fitting, &c., may look for work in established cities, where water-works and gas are used, and should be able to do labour at hot-air furnaces for heating buildings, &c.

5th. Painters are not much in request. A good painter takes a contract, and, from the useless or surplus of "*no trade*" people, manufactures his hands.

6th. Blacksmiths should learn to shoe, and that well, and be able to do the smithwork for wagons, sleighs, cutters, &c. No class of men do as well as good smiths, but keep from crowded cities at first. Start in rising places. The coal used is not what English workmen have in their shops, and therefore they do not get on very well at first.

I would beg of the British workmen to understand that Canada and America are not places for idle hands. Gold is not picked up, but only got hold of by industry and sobriety. Drink is the curse of an emigrant, and one who is fond of it is not wanted. Drink this side of the ocean will very soon "*fetch him*," as the Yankees say. Shopmen, clerks, and no-mechanic Londoners, pray stop at home.

And now for my own experience. After an idle life of many weeks, and notwithstanding the many advertisements that a neat expeditious draughtsman could be found, &c., the writer at length obtained a subordinate position under a Government surveyor to lay out "timber limits." So your humble servant bade farewell to Montreal, leaving the Law Courts, with their French and English knots to be solved by one spectator the less, and at once started for Ottawa, the capital of Canada. Ottawa is delightfully situated. Broad streets, but miserably-built houses, no waterworks, and were it not for the Parliament buildings, it would hardly come up to the mark of a substantial city. Considering that thirty years ago Ottawa was nothing but forest land, and now, I think, numbers 30,000 inhabitants, defects in architecture must be overlooked. At Hull, adjacent to Ottawa, with the exception of Niagara Falls, is one of the most magnificent rapids and falls ever seen by the writer. The water power is vast, and here have settled Yankee lumbermen, who give work in their mills and in the bush to several thousand hands. From Ottawa commences the first touch of hardships,—travelling in an old stage-coach, modelled after the fashion of the old Lord Mayor's coach (less paint and gilt). The surveying party put up for the night. The second day's journey is something like the first day's journey, only, as my companion remarked, "a little more so." We then arrive at "depôt" (a wooden house, with three rooms, far away from any settlement): after a good night's rest, our party wake up, and prepare for the journey proper. Snow-shoes are then handed over, with two blankets. Moccasins (deer-skin shoes) are then put on, with bags of pork, biscuits, tea, a tomahawk axe,—so we travel. Our party consists of an Indian cook, two Chinamen, who carry pots to cook pork and brew tea, with the "boss" surveyor and the enlightened writer. It will take too much trouble to describe surveying in the bush. Snow, 3 ft. to 6 ft. deep, the lines taken by a prismatic compass, and instead of pickets the trees are blazed; that is to say, a little bark peeled off. The sleeping to a Londoner is truly "primeval:" a couple of birch trees chopped down lighted for fire, tamarack branches for a bed, and a cotton tent. Fancy this with 30 degrees below zero. What with the barking of wolves the first night's camping out made your correspondent feel the loss of a chop and his bitter beer.

Four months exploring limits in the rough and tumble way described, only now and then seeing a stray Indian, certainly hardened the constitution of the once feather-bed Londoner, freeing him from all biliousness, but made him consumptively inclined for fresh meat and vegetables.

Having finished the survey, our party broke up camp, and by the aid of birch bark canoes, we made tracks for Ottawa, once more to realise the comfort of a bed, but fully impressed, in the writer's opinion, that a French Canadian shanty man could make anything with an axe, auger, and square, except a piano.

Having arrived safely at Ottawa, your correspondent met another victim to advertisements for a neat and expeditious draughtsman, and who had been employed in the "bush:" so we did the sights of Ottawa. The Parliament buildings are certainly a fine piece of architecture; the governor-general's establishment is somewhat convenient, but void of decoration in an artistic point of view. With a proper system of drainage, waterworks, and a more abundant supply of gas, Ottawa could be made a splendid city; but, oh! the roads, for mud and slush, would make a London vestryman shudder at his own shadow.

From Ottawa we "switch" off for Prescott, and make our journey west. Prescott is a broken-down town, unworthy of notice; so we start for Kingston, look at the beautiful harbour, and having listened to regrets of trade being dull, make up our minds for Toronto. Railways in Canada are not proverbially noted for speed. What with jolting and jumping on the Grand Trunk Railway, we arrived at Toronto, the "Queen's City," so called. Toronto city, next to Montreal, is the largest in Canada. The city seems to have been laid out on a dead level, good wide streets, handsome shops, and bids fair to grow very much, besides having the germs of

a good business place. It was here, for the first time since leaving England, that your correspondent heard a real genuine "chime" of church-bells, bringing with them thoughts of the happy days gone by, and recollection of those who have gone where the "weary are at rest."

Canada is abundantly supplied with water-power, and has all the facilities for manufacturing; but, though a thoroughly loyal man, I confess there is a lack of enterprise compared with that of the Yankees. If a Canadian makes "a pile," he commences shaving notes or money-lending, taking mortgages; and though the country through the eastern parts suffers from a long, hard, tedious five or six months' real winter, yet there are opportunities, particularly in the west, for capitalists to make money "hand over fist," as they say.

Before closing my letter I must not forget to say, that for loveliness, health, and beauty, some of the Canadian ladies cannot be surpassed, many of whom know how to, and do, milk cows, spin their own wool, cook like a Christian should do, and can play the pianoforte.

QUERCUS.

PURCHASE OF A PARK FOR LEEDS.

VALUE OF LAND.

THE Roundhay Park estate was put up for sale by auction last week, by Messrs. Hepper & Sons, at the Great Northern Railway Station Hotel, Leeds. When Lot 19, consisting of the residential estate of Roundhay Park, together with the Park Farm and Braim Farm, containing an area of 601a. 1r. 12p., was put up, Mr. Hepper said that the apportioned rental of the property was 550*l*. 8s. 4d. The timber, he stated, which was an important item, would be included in the lot.

The bidding then commenced at 50,000*l*., and rapidly increased by 10,000*l*. at a time until it reached 100,000*l*. The latter sum was bid by the Mayor, and elicited hearty cheers. The bidding having been resumed, it ran up by 1,000*l*. at a time to 106,000*l*., the Mayor continuing to bid in competition with other gentlemen, and the last bid being his. At this stage there was a pause, during which Mr. Hepper announced that he would now take 500*l*. at a time. A gentleman then bid 106,500*l*., and the Mayor bid 107,000*l*. against him, at which sum it was knocked down. Mr. Hepper said he was authorised to knock it down to the Mayor for the sum last named, viz., 107,000*l*. Prolonged and hearty cheering followed, winding up with three cheers for the Mayor.

Hartley's Farm and a number of cottages, the apportioned rental of which is 490*l*. 14s., was also bought by the Mayor, the amount being 32,000*l*.

SIR THOMAS DEANE, ARCHITECT.

IT is with deep regret that we record the death of Sir Thomas Deane, architect, at his house in Longford-terrace, Monkstown, county Dublin, aged eighty. He was the son of a builder in Cork, and lost his father when a mere youth, but being blessed with a mother of very superior mind, he was enabled, by the energy of his own disposition and her influence, to keep together a very promising business, and to maintain a numerous family of brothers and sisters. He undertook large works as a contractor for public bodies, and realised a handsome fortune; became mayor of Cork, and was knighted during his year of office, in 1830, by the Lord Lieutenant. He then practised as an architect, being employed largely by the municipal authorities, the Government, and by private individuals. At Cork he erected the Old and New Savings Banks, the Bank of Ireland, the commercial buildings, and Court-house, to which he put a classical portico, deservedly praised by Macaulay. He also erected the Queen's College in that town, upon a lofty prominent position, and which for its general arrangement and style of art, is entitled to commendation. He erected the fine Lunatic Asylum, at Killarney, an imposing mass, well distributed and finely executed in the stone of the country. At Dublin, one of the best buildings is the addition to Trinity College, conceived in the Venetian style, and elegantly carried out in its sculptural details by Irish carvers, whose natural taste he, and his partner, Mr. Woodward, brought out, by inducing them to imitate the foliage of nature, unrestrained by conventionalism. The most noted, perhaps, of the works with which his name is connected, is the Museum of Oxford, in which he associated his son Thomas, and their talented colleague, Woodward, an old pupil of Sir Thomas, whose career was cut short by illness before he had realised the full honours which his talents gave promise of attaining. Sir Thomas Deane then left the pursuit of the family career to his son Thomas, who, with a talent equal to the occasion, has already erected some striking buildings in Dublin, Oxford, London, and Tuam, to the cathedral of which diocese he was architect.

The late Sir Thomas was thrice married, and leaves a widow and several children. He was of a hopeful, cheerful spirit, with a kindliness of disposition and happy wit characteristic of his country. He maintained the most honourable character in all his engagements. He befriended many of the young artists of Ireland, who with daring and genius were struggling under difficulties to gain a name, and whose ultimate success proved the judgment with which he seconded their efforts. The careers of Maclise, Foley, and many others bear testimony to his kindly influence.

We must not omit to mention that he was for several years president of the Institute of Irish Architects, and that his eldest son John was the chief director and manager of the Manchester Great International Exhibition, which owed to his energy much of its great success.

REVUE GÉNERALE DE L'ARCHITECTURE.

WE see with great satisfaction that our accomplished colleague, M. César Daly, is again in the field, and that the *Revue Générale de l'Architecture*, after a suspension of more than a year's duration, has again appeared. Two parts are before us, and we shall take an early opportunity to give some account of them. In the mean time we cordially welcome this admirable publication, and we invite for it new subscribers from amongst our readers.

THE CONTRACTOR FOR THE GLOBE BRIDGE, PECKHAM, AND THE CAMBERWELL VESTRY.

ABOUT two months ago Mr. Riley, builder and contractor, entered into a contract with the Camberwell vestry for rebuilding the Globe Bridge, at Peckham, his tender being 1,900*l*., which at the time caused some surprise, inasmuch as it was so much lower than the rest of the tenders sent in, being only one-half the amount of Messrs. Manley & Rogers's (3,800*l*.), the highest, and 1,000*l*. less than that of Messrs. Jukes, Coulson, & Co., which was the next lowest to Mr. Riley's. It now appears that Mr. Riley is unable to ratify the contract, in consequence of one of his sureties having refused to sign the requisite security bond, and the vestry have, therefore, just decided to advertise for fresh tenders.

SELLING OFF THE ARCHIVES.

AT the Ossory Diocesan Synod, held a few days since, some extraordinary routine business was transacted, and more extraordinary proposals and resolutions were agreed to. Is it possible that the Cathedral Sustentation Fund is about to be created by the sale of its archives?

The Rev. James Graves, a well-known Irish antiquary, and member of the Irish (late the Kilkenny) Archæological Society, perhaps can answer us. A Mr. Staples suggested, at the Synod, that the very valuable collection of books left to form a library by two of the former bishops, one of them being Bishop Morris, should be disposed of. In fact, to use his own words, "the collection was going to ruin and decay,—the binding was nearly worn away, the backs and covers were falling off; and if something were not done, no books would soon be there. The building was not properly attended to, the books were in a damp place, and he would repeat, that unless some steps were taken, they would soon be beyond repair."

Hear now the remedy that Mr. Staples had, and did propose should be carried out. "He would propose that they should sell the books, and thus raise a sum of money,—perhaps 500*l*. or 600*l*.,—get a catalogue of them made out, *and send it to some London man who deals in those old books*; and they would raise a sum which would be of the greatest use to them." Some other members questioned the legality of such a sale; but Mr. Staples informed the Synod that he had a copy of Bishop Morris's will in his possession; and there was a clause in it which authorised such a sale for the restoration of the Cathedral.

We trust that the Rev. James Graves will be no party to such a sale; his life, labours, and antiquarian taste would forbid such a supposition. Even should there not be a halfpenny of funds, as the reverend antiquary himself has stated, as a member of the chapter of St. Canice, the books should be kept with loving care, and snatched from the fate that probably awaits them. A collection of books once scattered may never come together again, or be availed of for historical purposes.

The city of Kilkenny ought to feel humbled in the face of such a proposal, if she bears it meekly without protest. It will not tell much in favour of the energy of the whilom Kilkenny Archæological Society if these books be sold in the manner suggested, no matter what price is obtained for them.

SURVEYORS UNDER THE ECCLESIASTICAL DILAPIDATIONS ACT.

London.—We mention with much satisfaction that Mr. Gordon M. Hills has been elected surveyor for the diocese of London. In face of the remarkable list of testimonials which Mr. Hills submitted, we could not look for any other result.

York.—Mr. C. N. Armfield, Whitby, has been appointed one of the two surveyors under the new Act, for the diocese of York. Mr. C. T. Newstead, of York, is the other.

THE SEWAGE QUESTION AT COVENTRY.

AT the recent discussion of plans for using the sewage in irrigation it was stated that the estimated cost of Mr. Hawksley's pumping machinery is 24,000*l*. Surely something more economical than this could be contrived. If money is to be spent in this way, a fair return can scarcely be looked for.

BUILDING OPERATIONS AT BRADFORD.

MR. G. CORSON, architect, of Leeds, has designed a building for Messrs. Heugh, Dunlop, & Co., which presents a contrast to the usual type of Bradford warehouses. The structure, now approaching completion, stands at the corner of Peckover-street and East-parade; it is built externally of stone, and is designed in the Scottish baronial style. There are three frontages. The centre part of the front to Peckover-street is carried up as a tower, slightly projecting from the front, and contains the principal entrance, a simple square-headed doorway, with bold roll mouldings on the jambs. A bay window corbels out immediately over the door, and the tower is finished at the top with turrets on the angles, and a pavilion roof between.

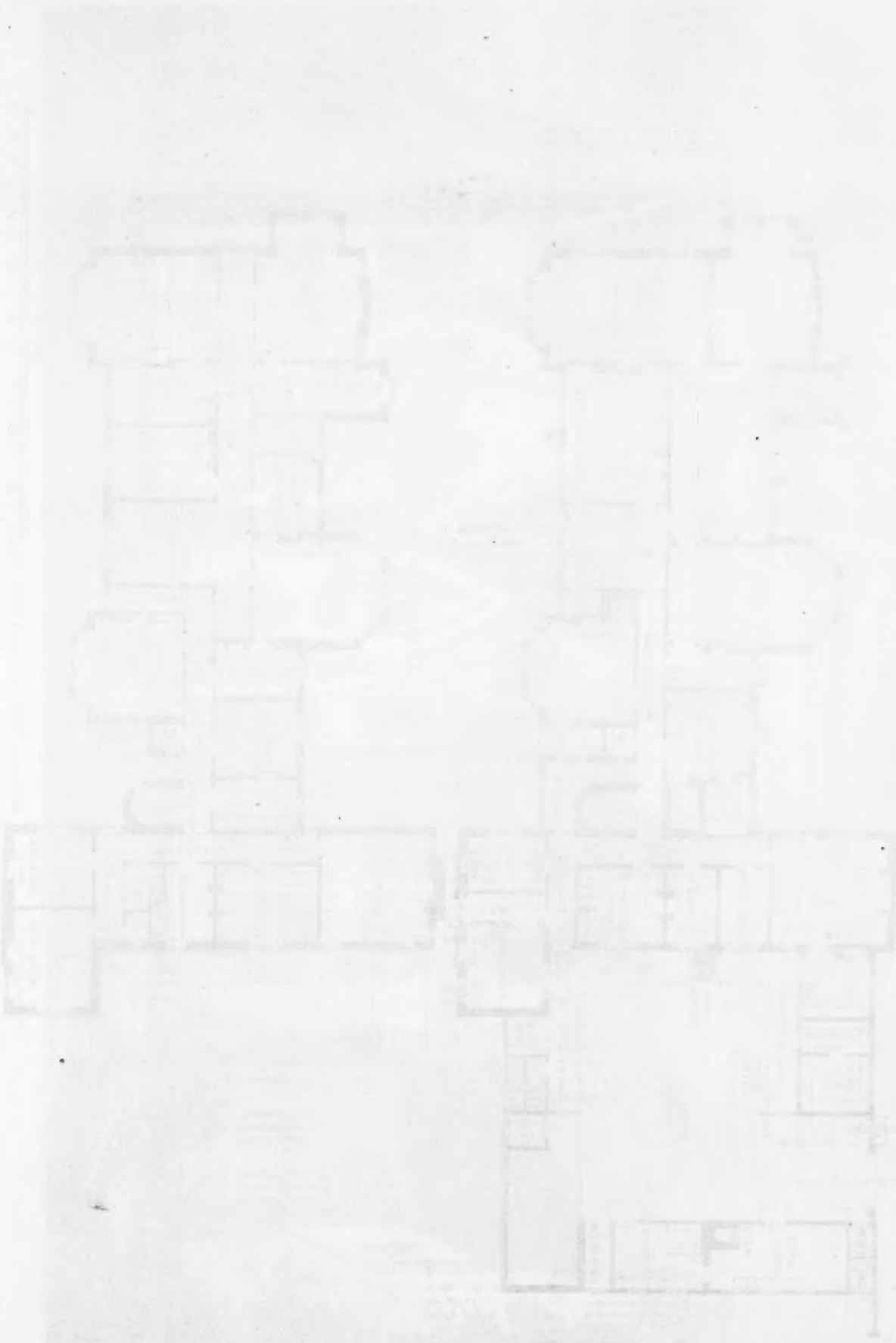
In other parts of the borough building is going on vigorously. A large warehouse is in course of construction adjacent to Peckover House. The third story is being put on the Town-hall, and the London stone-carvers have got to work. The Covered Market progresses slowly. A range of schools for the parish church, in the Bolton-road district, is making satisfactory progress, and schools are also being built in Otley-road, to serve as a place of worship as well. A new church is rising at Ripleyville, another at Great Horton; St. John's Church is to be replaced by a new building in Little Horton-lane; and the Wesleyans of Frizinghall are pushing forward their new Gothic chapel.

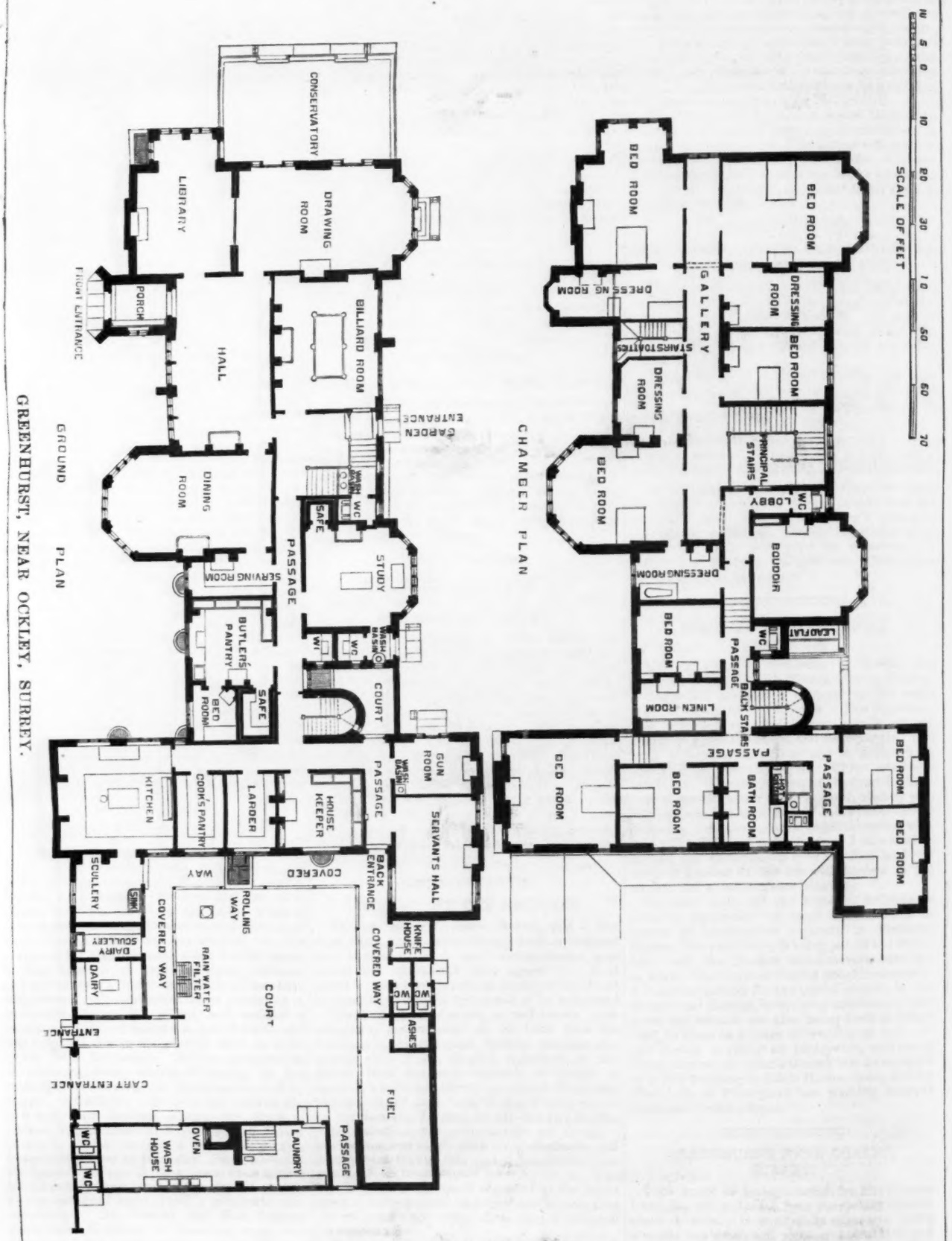
GREENHURST, NEAR OCKLEY, SURREY.

THIS house is being erected for Mr. Thomas Lambert, and is distant from the Ockley Station about a mile. It commands extensive views towards the south and west of Leith Hill and Horsham. The entrance is on the east. The walls are built of red brick from the neighbourhood, with Doulting and Bath stone dressings. The roofs are covered with Staffordshire tiles.

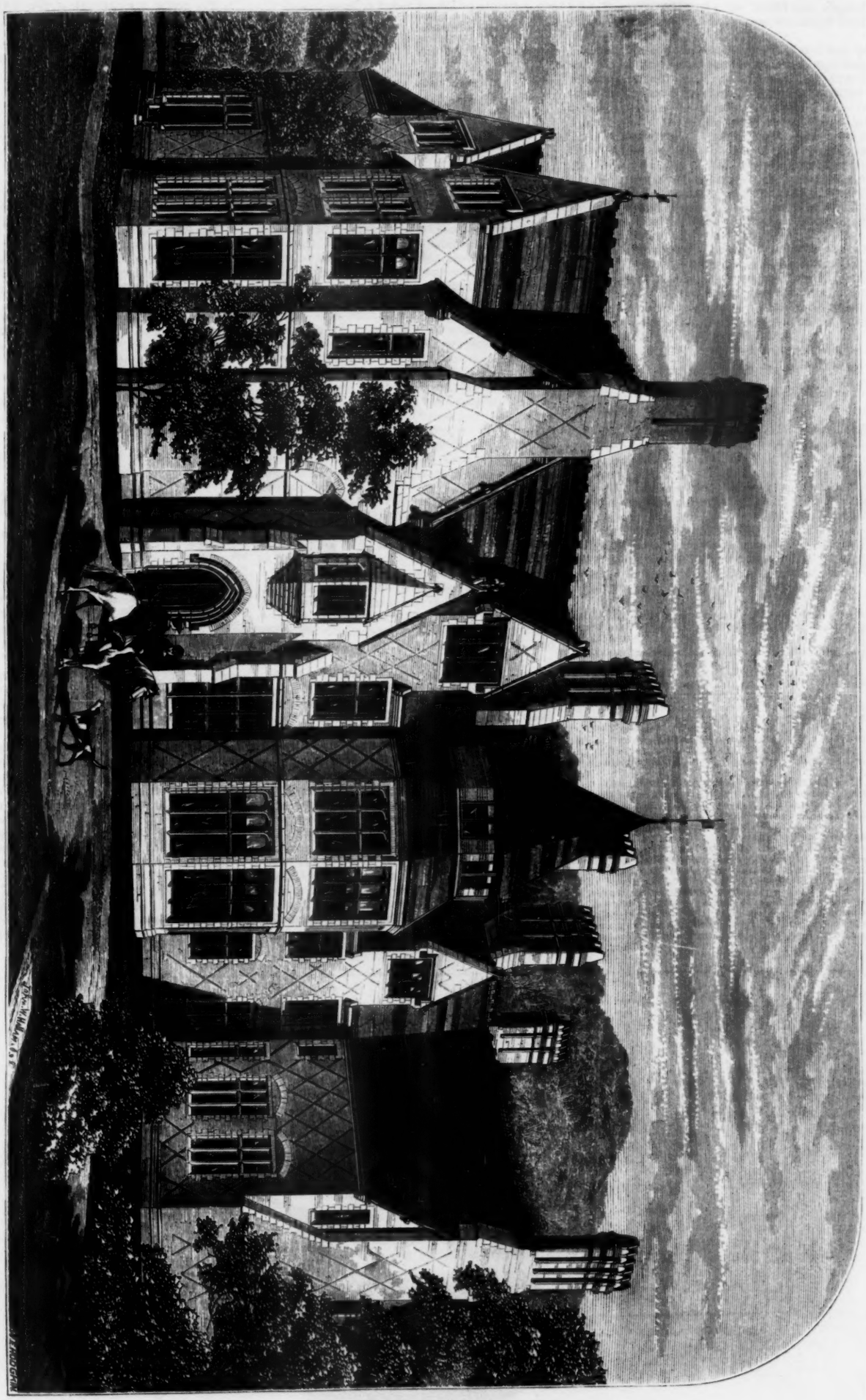
The cost will be about 11,000*l*. for the house, and 2,000*l*. for the stables, which are situated to the north of the house.

The builder is Mr. W. Shearburn, of Dorking; Mr. J. P. St. Aubyn, of the Temple, being the architect.





GREENHURST, NEAR OCKLEY, SURREY.



GREENHURST, NEAR OCKLEY, SURREY.—Mr. J. P. St. Aubyn, Architect.

FALL OF A WORSTED MILL AT GUISELEY, YORKSHIRE.

At Guiseley, on Sunday forenoon, a large and newly-erected worsted-mill fell in. So far as we can learn, it appears that Mr. Deacon, a draper at Shipley, had an extensive worsted-mill in course of erection at Guiseley, and was the first mill of that description in that place. The plans, it is alleged, were prepared by Mr. Walsh, plasterer, at Baildon, and the contractor for the work was Mr. Lapish. The building was four stories high, and was of considerable length. Only about one-half of it had, however, been built, and the roof of that portion was put on last week. The mill appeared to be all safe and sound when the workmen left on Saturday, but on Sunday forenoon, about half-past ten o'clock, the whole erection suddenly collapsed and fell to the ground with a thundering noise, without any warning whatever. The building presented a mere wreck, as scarcely any portion of the walls was standing. The roof-beams and iron girders and pillars which had been used in the construction of the place were broken to pieces. There were many conjectures as to the cause of the accident, and they were so conflicting that it will be better left to the parties concerned in the erection to give an explanation.

DECORATIONS OF ST. PAUL'S CATHEDRAL.

Sir,—Mr. Shone, in reply to my letter, writes as follows:—

"Sir Christopher Wren's intentions, mode of treatment, and, as far as they can be authenticated, his very designs will be scrupulously kept sacred and followed." He adds:—"The leading principle affirmed by all who have been consulted is this,—to make Sir Christopher Wren's intentions for the completion and decoration of the cathedral the main text, as it were; and to study to carry out, as implicitly as possible, whatever he may have expressed in drawing, model, or writing; and where these materials for guidance fail, that harmony is to be sought for to the fullest practical extent, with what he has proposed or done."

Mr. Shone gives these words as extracts from the programme set forth by the Embellishment Committee; and if the committee adhered to what they have here set forth, we would not complain; but what have the committee done? and what are they doing?—if it be the committee, and not the architect, who is answerable.

Sir Christopher's last work at the cathedral was the construction of the choir, and he put the organ where it was thought best to be. The whole cathedral was open to his choice. He might have put it,—as was lately done,— in one of the ladies' closets. We are told that it did stand on one side of the choir, in the old cathedral; and had not that situation been condemned, he might have put it there again, or he might have made it clothe the two grand pillars against which it is proposed to place it now. He did neither. To use Mr. Street's words,—

"He acquiesced in Father Smith's determination, that the organ should occupy the place in which beyond all doubt its tones produce the greatest effect; but he limited the size of the instrument most carefully, leaving enough space around and above it, to allow of suggestions, at least of a distant view, and so creating that mystery of things half seen, which all students of Mediæval art well know was the secret of its greatest successes."

The width of the choir between the pillars is 40 ft. The organ occupied about 16 ft., leaving 12 ft. open on each side, to allow, as you enter at the west door, the receding vista to be seen,—*i.e.*, arch after arch in the perspective, gradually receding from view; and as to the height of the organ, its shape being rather horizontal than vertical, it left the whole of the roof, or nearly so, to be seen. What was seen gave sufficient suggestions to the imagination to comprehend the whole, and moreover awakened a desire to see what was partially hidden, and thus reserved beauties hereafter to be discovered.

Ah, but, says Mr. Shone, "nothing is more certain than that he (Sir Christopher) made the best of a situation forced upon him." Of course, forced upon him it was. Given the cathedral, and the musical service to be performed in it, where was the organ to be placed? It was to be placed somewhere, and he put it, whatever might be the difficulties of his choice, and however constrained by superior powers, where he thought it could best be. Not in one of the ladies' closets, not reared up in two separate sections, to hide the magnificent pillars, and destroy the vista, but in the place where, when Mr. Penrose became architect to the cathedral, he found it.

But further, Sir Christopher not only placed the organ where he did, but he designed the elegant pillars on which it stood. He wished these pillars to be seen in the position in which he placed them.

The placing the organ on these pillars was his last work; and if the committee had done their duty, and acted according to what they profess in their programme, they would have begun where Sir Christopher left off, and not by ruthlessly altering and destroying what he had done.

What is the consequence of their removing the organ? The return-stalls are carried away to the chancel, and the two elegant gates erected there by Sir Christopher Wren removed to make way for them. The beautiful columns are carried away into the north and south transepts, and made to do duty as porches, and these porches are so arranged as to interfere with Sir Christopher's grand intentions.

He made three principal doorways, which, when seen, give a grandeur to the whole building. Would any one think of putting an inner porch to the west door, leaving only the upper half of it to be seen, and thus marring its grand proportions? And it is a similar error to cut the north and south doors in two, and leave only the halves of them to be seen above.

Had the organ not been moved, these pillars would not have been moved, and the desecrations at the north and south doors would not have been perpetrated; nor would the elegant gates in the chancel have been wrenched from their positions.

I ask Mr. Shone, and through him I beg to ask the committee, whether this is completing what Sir Christopher left undone? Mr. Shone says that the lowering the stall-work was "*unanimously*" agreed to by the committee: *now*, it appears, it is to be as unanimously raised up again. I ask, as one of the public—I have a right to ask—what reliance can be placed on such a committee? Can they do and undo, almost in the same breath, and not feel ashamed? To settle such matters by a committee is pretty much the same as asking an assembly of women in Exeter Hall to decide upon some important church doctrine.

There ought to be an architect of a master mind, who shall be able to say to the committee, "Gentlemen, *this* is *my* plan, and if you insist upon things of which I disapprove, I must make you responsible—not myself." And until such a person is found, St. Paul's will not be properly embellished.

James Lupton,
St. Paul's Cathedral.

TO RENDER SEWERS OF DEPOSIT SELF-CLEANSING.

With this I beg leave to submit a section and specification for making the sewers of deposit in Belgravia, and elsewhere, in the Old Westminster sewer districts, self-cleansing. The cost of the work would be not more than 2s. 6d. per foot run, or 660*l.* per mile. I think I may venture to say that no improvement could equal this for simplicity, durability, economy, and efficiency. Permit me to suggest that you should give this section and specification in the *Builder*, in order to show Local Boards and their surveyors "how to do it."

John Phillips.

Specification for Making the Sewers of Deposit in Belgravia and elsewhere, in the Old Westminster Sewer Districts, Self-Cleansing.

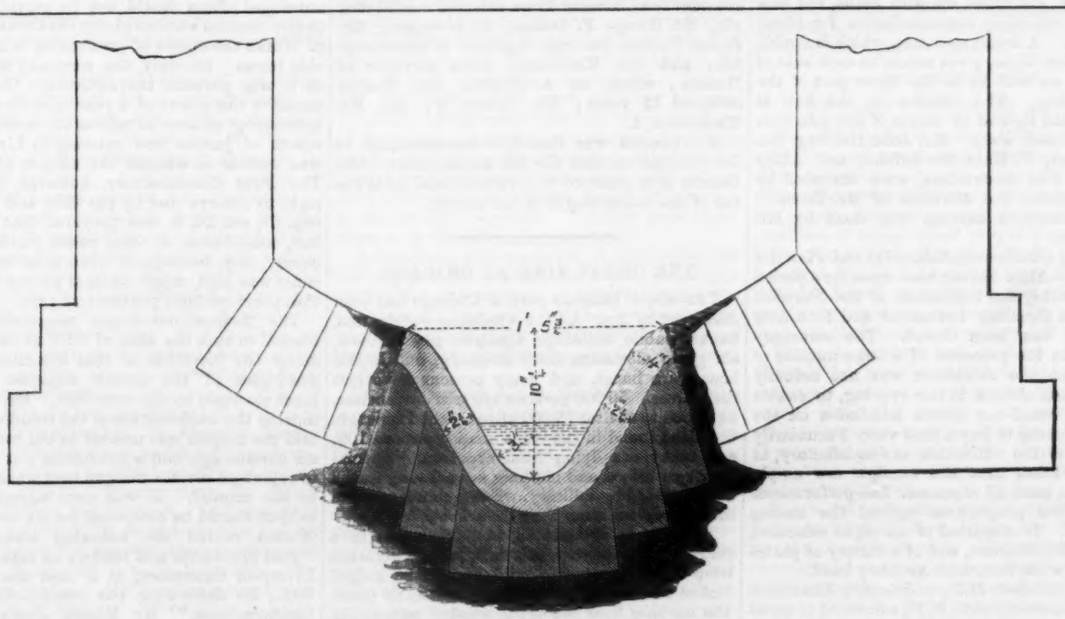
1. Raise the hard deposit in the sewers to the surface, and cart it away; flush away the soft deposit, and thoroughly wash and cleanse the side walls and bottoms, with jets attached to hose carried down into the sewers from hydrants fixed into the water-pipes in the streets.

2. Take out in lengths of about 6 ft. at a time, seven courses of the brickwork along the centre of the inverts; put small rebated wallings with struts, between the remaining courses at the sides; then excavate the space to the depth shown by the drawing. The soil, rubbish, and earth arising from the work, lift to the surface and cart away.

3. Well wash and clean the bricks taken out of the inverts, then lay them solidly in Portland cement (half cement and half sand) in the excavated space, in accordance with the drawing, and form the upper part to a mould corresponding to the underside of the channel tiles.

4. Remove the strutting, and evenly bed in Portland cement the channel tiles upon the sunk brickwork, as shown by the drawings; then solidly flush up and point the joints of the tiles, as also the joints of the old brickwork in the inverts and side walls, with neat Portland cement, and leave the sewer-bottoms clean and perfect.

5. The channel tiles to be made of stoneware or fire-clay in 2 ft. lengths, 2½ in. thick, perforated longitudinally with cylinders ¾ in. in diameter, accurately moulded to the shape according to the drawing, salt-glazed, and burnt to a vitreous substance.



Section showing Self-cleansing Sewer.

ART AND SCIENCE.

Burslem Schools of Art and Science.—The annual meeting of the Wedgwood Institute School of Science and Art has been held in the town-hall, Burslem, under the presidency of Sir Smith Child, bart., M.P. The attendance was numerous. Mr. W. Woodall (chief bailiff) read the report of the committee, which stated, that during the year 168 students had entered the school, besides the ladies' morning class; and at the local examination, in May, 38 students were successful, and 14 Government prizes were awarded. For the national examination 971 works were executed by 126 students. The chemistry classes had been attended by 91 students, of whom 39 were examined, and 28 passed. The committee were, however, surprised at the extraordinary apathy in quarters where ready co-operation might have been looked for; and that in a vast population, pursuing occupations necessarily artistic and scientific in their character, there should be so small a per-centage desiring intellectual advancement, and so large a proportion content with an unquestioning and stolid dependence on traditional usage. The committee felt they had some reason to complain of stinted payments by the Department of Science and Art on the results of examinations, as compared with what previous experience had led them to expect. The committee expressed congratulation on the Institute being at last freed from debt, and indulged in confident expectations, as the necessity for technical education becomes increasingly apparent, of a support of the school worthy of the enterprise and public spirit of the district. Mr. G. Theaker, master of the science and art school, and Mr. A. L. Sparkes, master of the chemistry school, read their reports.

Salisbury School of Science and Art.—A building, erected at a cost of 3,000l., for the use of the Salisbury Literary and Scientific Institution and the Salisbury School of Science and Art, in New-street, in that city, with a hall capable of seating 800 persons, has been publicly opened. The Dean of Salisbury has been a liberal subscriber to the building fund, which is to preserve the memory of the late Bishop Hamilton. The new front is designed in the Gothic style, and built of red brick, with coloured brick arches and devices, stone dressings to the doors and windows, Mansfield stone shafts and carved caps. The building comprises, on the ground floor, a reading-room, and on each side of it a wide entrance-passage to the lecture-hall and staircases. On the first floor are the library, class, and committee rooms; and above it is the School of Art, which is 34 ft. by 23 ft., and 17 ft. high. The lecture-hall is at the back of this building, and was formerly the Salisbury Theatre. The old stage, galleries, boxes, &c., have been swept away, and thus a room obtained which is nearly 70 ft. long by 33 ft. wide. The walls have been raised about 6 ft., a new roof put to the building, and windows inserted. A large gallery, supported upon iron pillars, has been erected, and fitted up with stalls, the hall and gallery affording accommodation for about 800 persons. A broad staircase, which is double above the first flight, gives access to each side of the gallery, as well as to the upper part of the front building. The interior of the hall is decorated, and lighted by means of star-jets from the ceiling and walls. Mr. John Harding was the architect, F. Hale the builder, and Abley foreman. The decorations were executed by Mr. Neal, under the direction of Mr. Toomer; and the stonework carving was done by Mr. A. C. Kemm.

Closing of the Norwich Industrial and Fine Art Exhibition.—After having been open for a period of two months, the Exhibition of the Norwich and Eastern Counties Industrial and Fine Arts Association has been closed. The ceremony took place in the presence of a large number of persons, but the exhibition was not actually closed till ten o'clock in the evening, to enable those who could not obtain admission on the previous evening to pay a final visit. Pecuniarily the results of the exhibition are satisfactory, in so far, at least, that the receipts are amply sufficient to meet all expenses. The performance of a musical programme opened the closing ceremonial. It consisted of an organ selection, played by Dr. Bunnett, and of a variety of pieces by the Norwich Volunteer Artillery band.

Sir John Lubbock, M.P., on Scientific Education. Sir John Lubbock, bart., M.P., addressed a meeting of working men on Saturday night at the Trades Hall, Liverpool. The occasion was that of the delivery of prizes in connexion with classes of science meeting at the hall, and affiliated with the South Kensington institution; and there were present, amongst other gentlemen who take a warm interest in the elevation of the working classes, Messrs. Jas. Samuelson, F. Archer, J. A. Picton, Rev. J. Beard, S. G. Rathbone, Dr. Sheldon, Dr. Costine, and Mr. Francis Boult. Sir John Lubbock, who was loudly cheered on taking the chair, said that all must rejoice to see how the love of science was spreading in the country. It was one of the most hopeful features of the age. Speaking first of the relations between the Government of the country and the scientific societies, Sir John said that there was no other country in Europe where the Government did so little for such societies. The societies, however, did not wish that this should be altered, and believed that entire freedom of action was the best for the Government, the country, and the societies themselves. True, there was a grant of 12,500l. under the head of scientific societies, but 10,000l. of this was spent in meteorological observations, and 1,000l. given to scientific research. With regard to scientific research, he declared that the Government had never been chary of incurring expense, and the hesitation as to the expedition relative to the last eclipse arose from a misunderstanding, and not from reluctance to spend money. With regard to elementary schools, he could not speak of the Government in such satisfactory terms. The scientific men throughout the country unanimously regretted the manner in which the grants to those schools were distributed. Reading, writing, and arithmetic, although the foundations of education, were not education itself, and the schools would never be placed on a sound and satisfactory basis until they took a wider ground. Sir John quoted in support of this view the resolutions of the British and the Social Science Associations, and the opinions of those practically concerned in education. With regard to schools of science, he pointed with pleasure to the fact that when they commenced in 1860 there were nine schools with sixty students, and that now there were 810 schools with 30,000 students. In conclusion, Sir John, though he criticised the positions taken by Mr. Forster, paid a high tribute to the great services which he had rendered to the cause of national education.

The Leeds School of Art.—The exhibition of the students' works at the Mechanics' Institute closed on Saturday last, on which day 3,259 persons visited it. There are now 300 students. Out of more than 2,600 drawings and paintings produced within the year, 468 works were selected for exhibition, and a large proportion of them were meritorious. Dr. Puckett is the head-master.

BOROUGH ENGINEERSHIP OF LIVERPOOL.

The special committee met on Monday last to consider the claims of three selected candidates, viz., Mr. George F. Deacon, of Liverpool; Mr. James Lemon, borough engineer of Southampton; and Mr. Mackinson, town surveyor of Dundee; when, on a division, Mr. Deacon obtained 12 votes; Mr. Lemon, 9; and Mr. Mackinson, 3.

Mr. Deacon was therefore recommended to the borough council for the appointment. Mr. Deacon is in practice in Liverpool, and he is the son of the under-sheriff of the county.

THE GREAT FIRE AT CHICAGO.

The whole business part of Chicago has been destroyed by fire. All the wholesale warehouses, banks, public buildings, theatres, great hotels, six grain elevators, much shipping, and 10,000 houses are burnt, and many persons have lost their lives. 50,000 persons are without shelter, but tents to shelter 75,000 have reached Chicago. The dead found in the ruins already exceed 100, and many are dying from exposure. Special trains with food and clothing are arriving in the city, guarded by military. Forty plunderers and turbulent characters have been shot.

The fire is now stated to have begun in a stable. A boy having, it is said, taken a kerosene lamp into the stable to milk a cow, the animal kicked the lamp over, and set fire to the place. The burning fluid ran to the wooden pavements, and thus the flames were extended, and not through the party-walls, we presume, unless they were of wood. As the fire progressed people became crazy with excitement, and many were trampled to death and others burnt. 500 persons are believed to have perished. The very waterworks were destroyed, and several square miles of the city are in ashes. The loss is estimated at three hundred millions of dollars.

This city is one of the most marvellous in the history of the United States. Up to 1831 it was only an Indian trading post, and even in 1840 its population did not exceed 5,000. From the latter period, however, it rose rapidly in population and wealth until it attained an importance second, perhaps, to that of no commercial city in the world. It has long been known as the great trading city of the far West. It is there that the grain of the West and other important productions are collected for transport to the seaboard and to Europe. Much as has been said about the rapid development of Liverpool within the last century, it is nothing compared with the marvellous strides made by Chicago. The population in 1850 was 28,269; in 1857, 130,000; and probably at the present time the total is little short of a quarter of a million. Chicago is beautifully situated on an inclined plain extending along the shores of Lake Michigan for many miles.

DRAWINGS AND THE POST-OFFICE.

Sir,—Doubtless many of your readers will have become aware that since the 5th of October an imperial size drawing can no longer be sent as a roll through the post, the limit of length now being 18 in.; and as it is a matter of some importance to me, as I suppose it is to a great number of persons, I feel an exception should be made, such as that packets may be 22 in. long, if not exceeding 5½ in. by 5½ in. in width and thickness.

Unless the Postmaster-General will reconsider his order, and restore to us the privilege of sending drawings by post, one will be forced to resort to the antiquated methods of sending them either by parcels delivery, carrier, or railway, which would involve considerably greater trouble and expense, as well as much annoyance in their not being delivered by the expected time.

M.

LIVERPOOL.

The new County Courts question, the proposal to decorate the council chamber and luncheon-room at the Town-hall, and the exhibition of paintings, were amongst those subjects which were under consideration at the last meeting of the Liverpool Town Council. A letter of the secretary to the Government Commissioners of Works, suggesting that the corporation should provide a site for the proposed County Courts, for which the House of Commons had voted 20,000l., had been replied to by the finance committee, declining to agree to the suggestion, but stating that the committee would recommend to the council that the vacant land behind the municipal offices should not be parted with for twelve months without giving the Commissioners of Works the option of purchasing it on reasonable terms. In reply, the secretary stated that as it was probable the Judicature Commission would in the course of a year have formed some satisfactory scheme to reform the multiplicity of courts of justice now existing in Liverpool, it was useless to discuss the subject at present. The First Commissioner, however, thought it right to observe that by the 13th and 14th Vic., cap. 61, sec. 24, it was provided that the town-hall, court-house, or other public building to any county, city, borough, or town in which a county court was held, might be used for the sittings of that court without payment of rent.

The finance committee recommended the council to vote the sum of 600l. to be expended under the direction of that committee, in the decoration of the council chamber and the luncheon-room at the town-hall. Mr. Picton, in moving the confirmation of the recommendation, said the subject was mooted in the council about six months ago, and a committee was appointed to report on certain designs that were presented to the council. It was then agreed that the subject should be postponed for six months. Mr. Minton moved the following amendment:—"That specimens and tenders be asked for from Liverpool decorators, at a cost not exceeding 600l., for decorating the council-chamber and luncheon-room." Mr. Minton afterwards withdrew his motion, and Mr. Picton said it would be better to allow the matter to be brought for-

ward at some future time; and meantime the general proceedings were confirmed.

In reference to the exhibition of paintings, Mr. Picton said the exhibition which had been opened in the Free Library and Museum had turned out, so far, to be a great success. Since the exhibition opened, pictures had been sold to the extent of 4,000*l.*, and that would be encouraging to the artists who had sent their pictures. The committee could now see their way clear to the fact that there would be no loss, but some profit.

THE SOIL PIPE AND SANITATION.

Sir,—On perusing the *Builder* of the 7th inst., I find that the soil-pipe has been performing an important part in the sanitation of Croydon, with which the name of a medical gentleman is closely associated.

Will you permit me to state that in the second edition of "A House for the Suburbs," published in 1861, the following passage occurs at page 166:—

"I have found it advantageous in practice to take the soil-pipe quite up to the gutter, letting it serve also to carry off the rain-water, and when that cannot be done, to lead a small pipe up through the roof, so that the foul air, instead of rushing at every opportunity into the house, may find a ready exit at the top."

Thomas Morris.

THE RIGHT OF WAY.

Sir,—Have you had difficulties in public through making a stand for your right side of the pave? I admit to many concussions. I fight my way along when I feel strong till I meet a wrong-sided booby too big for me. I invariably decline contentions with women; make a dead set at boys, they are not too old to learn; but, sir, is it not annoying that green policemen should run a muck amidst London pedestrians they are paid to rectify? Official instructions are needed here. Recently, a friend of mine had an obstinate encounter on London Bridge; it was push for push, till an ignorant policeman came up and offered to *run them both in!* If you bob aside, the other party often does the same: is it then right to hit out? E. T.

CLEANING TILES.

Sir,—Will some correspondent kindly inform me of the best method of cleaning white tiles? The joints become incrusted with hard carbon, and the edges of the tiles for a considerable width are black. The hardest brush and water with soda will not remove the marks. I should also thank any of your correspondents if they could inform me of the best mode of fixing these tiles with cement. I have used various cements, but the tiles come off in frosty or very hot weather. A. Davis.

INVITATIONS TO TENDER.

Sir,—I accepted an invitation last August to tender for the completion of four houses in Cedars-road, Clapham, from Messrs. Mayhew, Salmon, & Whiting,—Mr. J. Thomas, architect. I tendered agreeably to their request, was lowest, and was rejected. Will you kindly inform me whether I have any remedy for this? I had to verify the quantities by measuring up the work to be done, as the bills were not explicit, and as a return have my name published below the party chosen to do the job, which is, of course, calculated to do me an injury. I should feel greatly obliged by your informing me what remedy I have, if any. A very Old Subscriber.

*** It would probably depend on the terms of the invitation. Most certainly if a builder be *invited* to tender, and is lowest in amount, he ought to be employed.

THE NEW MORGUE, DUBLIN.

The Corporation of Dublin has at last established a necessary sanitary requisite long called for in Dublin.

A square block of granite-faced buildings, originally constructed for a savings-bank, in Marlborough-street, has been transformed into a gloomy morgue. The history of the old structure is as melancholy as the purposes for which it is now used. Nothing ever seemed to thrive under its roof from its first foundation.

Idle for years, and again occupied at long intervals as a meeting-house, emigration office, reading-room, soup-kitchen, registry office, shipping office, and as the "head centre" of the National and Fenian Brotherhoods, it has reached its sepulchral climax by being dedicated to King Death as a dead-house. The building, as to locality, is very well situated, being a few yards from the river side. It is two stories high, and well lighted above. The ground floor is converted into the morgue proper; it is divided into three compartments, the chamber for the corpses, a dissecting-room, and a waiting-room.

All *post-mortem* examinations will, of course, take place in the dissecting-room, for which necessary fittings are provided. The morgue is fitted with marble slabs, on an inclined plane, on which the bodies will lie, over whom a stream of water will constantly flow (it is hoped). The upper story contains the coroner's court and retiring-room for the jury. The former is somewhat spacious, being about 40 ft. by 30 ft. The story is also fitted up with the necessary accommodation for coroner, advocates, jury, witnesses, and the press. The morgue was not long opened when it received its first melancholy baptism in the person of a male infant who was probably strangled or mismanaged at birth, and was left exposed in a public hall.

DAVENTRY ASSEMBLY HALL.

The New Assembly Hall was opened last week. The building, the property of a company, stands fronting Foundry-place, and runs parallel with New-street. There are four entrances, two from Foundry-place, one of which is private, and two at the opposite end, communicating with New-street by a long vestibule. The hall is 80 ft. long, 37 ft. wide, and 34 ft. high to the boarding at the top. The stage or platform at the western end is 20 ft. long by 15 ft. deep, and is fitted up with foot-lights and two bracket-lights. Underneath and on the sides of the stage are three rooms, exceedingly handy for entertainments or public meetings. The auditorium is intended to accommodate 600 people, but about 700 were present at the opening. There is no attempt at display in the frontage, owing to its retired position, but the elevation is neat and simple. The main feature of the interior is the roof, which is constructed with eight principals, the ribs of which are elliptical in form. The thrust of the roof is counteracted by tie-rods. There is a boarded cove on either side, having moulded ribs starting from pendants at the foot of the queen-posts. These are stopped by a plaster cornice running round the room, 14 ft. from the floor line.

The room is lighted from the roof by side-lights, in pairs, between the queen-posts and top lights, extending from the matched boarding at the collar-beam down to the top of the side-lights. The roof is a semi-decagon in form, and the lines of the principals, combined with the cove on either side, present the appearance of a trefoil. The gas-pendants brought from the centre of the collar-beams of six of the principals, extend about 7 ft. below the tie-rods.

The building was designed by Messrs. Walford & Hewitt, of London, and the work has been executed by Mr. Gee, builder, Daventry. It may be added that on Wednesday night the acoustic properties of the hall were fully tested, and proved to be all that could be desired.

THE TRADES MOVEMENT.

Settlement of the Engineers' Strike.—The great strike of the engineers at Newcastle is happily settled. Sir William Armstrong, Mr. Philipson, Mr. Joseph Cowen, jun., and Mr. Burnett, president of the League, met, and after some discussion, agreed to all the details for carrying into effect an arrangement suggested by Messrs. Philipson and Cowen. After the meeting Sir William Armstrong submitted the details to the associated masters, and Mr. Burnett to the committee of delegates. Both parties agreed to the conditions proposed by their representatives. Mr. Philipson signed the document on behalf of the employers, and Mr. Cowen on behalf of the men, and the negotiations terminated. The result was hailed with great rejoicing all over Tyneside. Flags were hung out of the windows of the meeting-houses of the engineers, and the people everywhere congratulate themselves and their neighbours at the happy termination of the most prolonged and resolute strike ever known in the north of England. The men were to resume work this Thursday morning.

A lime-light demonstration of the trades and working men of London, was held in Trafalgar-square, for the purpose of congratulating the engineers of Newcastle on the favourable termination of their strike, and to form a "national league for the furtherance of the nine-hour movement."

The compromise which has ended the strike is one with which both parties may be satisfied. In substance it is a victory for both; but the nine hours' day is granted, though not to begin for three months. Meanwhile, the men go in, not on the old terms, but on the terms of the compromise originally offered by Sir W. Armstrong. When the strike began they were working fifty-nine hours a week: ten on each of the first five days, and nine on Saturday. They will now go back to work fifty-seven hours a week; and on the 1st of January they will begin working fifty-four hours a week. The arrangement that overtime shall not count in a man's pay till he has made his fifty-four hours of regular time is a concession to the masters which enables them to yield with credit. One of Sir W. Armstrong's objections to the nine hours' day was that the men would be tempted to increase their pay by losing time in their regular hours and making it in the hours which are better paid as overtime. A man might thus work only fifty-four hours a week, but might make, say, forty hours at the regular wages, and the other fourteen at overtime wages. It is only fair that extra pay should be reserved, not for certain hours of the twenty-four, but for extra hours of the week. The principle of a nine hours' day, with this necessary safeguard, may now be considered as established.

The precise terms presented to employers and men were said to be the following:—"Supposing the employers to concede the fifty-four hours per week, the men would agree to work overtime, when and to the extent required by the employers. The wages, both as to ordinary wages and overtime to remain the same at the different factories as prior to the strike. The wages to be reckoned by the hour, and quarter-hour, and paid weekly at 12·15 p.m. on Saturday. The agreement to be for twelve months, with power to either party to determine at the end of six months by giving one month's previous notice. The men to go to work on the arrangement now existing in the shops (fifty-seven hours), and the new terms (fifty-four hours) to take date from Jan. 1, 1872."

The proposals were unanimously accepted.

SCHOOL-BOARD DOINGS.

On the motion of the Rev. J. A. Picton, the London School Board have decided to instruct the School Management Committee to obtain information concerning the Prussian system of class-division; and to report to the Board how far it would be desirable, in determining the plans of new school-buildings, to keep in view the possibility of the adoption of a similar system in London. One would have thought the collective wisdom of the School Board would have been able to devise a system of education without going to Prussia for a model. We do not wonder that a daily contemporary inquires if Englishmen are losing all independence of thought and action.

At the instance of Mr. McGregor, a committee of the London School Board has been appointed to inquire into the extent of the present bathing accommodation in the metropolis, and the best means for its systematic extension, and to report thereon to the Board, so as to allow due time for the provision of cheap and convenient swimming-baths for the next bathing season. It gives us great satisfaction to find that the School Board has taken up this question.

On the motion of Mr. Reed, M.P., the Board has agreed to purchase a site in Whitechapel for a school, at a cost of 9,000*l.*

At the last meeting of the Birmingham School Board it was announced that the Board proposed to apply to the public commissioners for about 20,000*l.*, to be expended in the building of five or six rate-supported schools.

SEWAGE POLLUTION AT KEW.

Sir,—The evils of want of drainage, leaking cesspools, and a sewage-polluted soil, have been often adverted to in your columns, and recently with reference to Ilminster; but there exists at the present moment a glaring example of such a condition of things much nearer home. At the little picturesque village of Kew, close to the National Botanic Gardens, and around the favourite Green to which, in the summer-time, Londoners resort in thousands for the sake of *fresh air*, the whole system is in full operation.

There is no sewerage at Kew: the houses, about 160 in number, some large and some small,—a royal residence being one of them,—discharge their filth simply into cesspools, and store it by them, or rather it is their intention so to store it; but a little closer investigation will show that they are very far indeed from succeeding in doing so.

There are extensive market-gardens in the neighbourhood of Kew, where the demand for manure is considerable. The contents of the cesspools, when available, are, therefore, valuable for this purpose, and yet it is not found possible to make them in this way a source of profit to nearly their nominal value, inasmuch as the quantity of fertilising material, in proportion to

the total discharged into them is unduly small, only about one-fourth of that total being reclaimable when the cesspools are emptied.

The rest all goes away. Where? This is not difficult to ascertain. In the case of the houses nearest to the Thames, it goes directly there between each tide; and these houses are, in a sanitary point of view, probably the best off. Elsewhere, and where the distance, as compared with the elevation above low water, is too great to allow of a percolation in the short space of twelve hours, the pollution remains principally in the neighbourhood of the spot where it has entered; the river suffers less, and the subsoil more. Each cesspool forms a centre whence a poisoning influence extends in successive concentric circles, until, by the intersection of these circles, the whole intermediate space is filled up, and alike contaminated.

The purifying properties of earth, especially of a light sandy soil such as here exists, are of course well known, and, were the sources of pollution only few and scattered, or could the polluting liquid be compelled in all cases to filter through a considerable thickness of the soil, their injurious qualities could be to a great extent neutralised, but when the permanently saturated subsoil is within a few feet of the surface there is obviously no room for this. Now at Kew water is always found at about 5 ft. below the ground, and if in the course of building operations an excavation is incautiously made, even to this depth, at the time of a high tide, the foundations are instantly flooded with water. It is needless to say that the water so entering, and which frequently finds its way into the cellars and basement floors of the houses, is a more or less diluted solution of the neighbouring cesspits. In addition to this polluting influence, the fertilising properties of the amount left in the cesspool is weakened by the loss of the most valuable ingredients, viz., those in solution in the escaped more liquid portion.

The question of sewerage is more important now from the fact that a large estate, abutting upon the south-west corner of the Green, and lying between it and the newly-opened Kew Gardens Station, is now being rapidly built upon, apparently without any provision for drainage, but simply causing a multiplication of the already too numerous cesspools, which in a few years' time will, in all probability, be trebled in number.

Surely, with the market gardens requiring manure, and in the face of the awakening interest in and knowledge of the results following such a condition of things, it is not a time to permit it to continue, still less to allow of its extension to what will, I fear, be found, perhaps too late, a very grave conclusion. On the contrary, the present seems the very time to arrange a system of drainage in connexion with which the new houses should be built. W. Scott.

FUNERAL OF M. DUBAN.

We understand, and are glad to mention, that on the occasion of the funeral of the distinguished French architect, M. Duban, Professor Donaldson, who was present, pronounced a discourse, which produced considerable effect, and greatly interested his auditors. Three other addresses were delivered.

CHURCH-BUILDING NEWS.

Bingley.—The parish church here has been reopened for divine service, after having been restored, and the interior fittings renewed. The restoration has been carried out from designs prepared by Messrs. T. H. & F. Healey, architects, Bradford. The fabric of the church generally was in a fair state of preservation, taking into account the rough usage it has experienced at various dates. The windows were in part decayed, whilst insertions of heterogeneous style have further tended to weaken the structure. The buttresses with which the building has evidently been furnished have disappeared to make room for interments, and circumstances have prevented the restoration of these and other features. The restoration has comprised the rebuilding in part of the north or Ryshworth chapel, the east gable of the chancel, the south wall of the south or Riddlesden chapel, and the south aisle of the nave. The old porch, of incongruous character, has been replaced by one in keeping with the rest of the church. Several windows have also been renewed, particularly those of the north chapel and the east or chancel windows, which are wholly of new design, the rest being generally copies of the old work they replace. The west gallery and organ-loft have been removed, and the tower-arch opened to the nave. The flat plaster ceiling, which obscured the old nave-roof, has disappeared, and these changes in themselves have chiefly contributed to the effect of the restoration. The nave-roof has not needed renovation, but has been simply cleaned, plastered between the spars, and an embattled cornice added. The chancel-roof is wholly new, and, with those of the aisles and south chapel, is of oak, with boarded panels and carved cornices. The interior stonework has been redressed, and the clearstory-walls have been stripped of the plaster and roughly chiselled over. The floors have been preserved at their original levels, and the whole area of the church has been covered with a bed of concrete. In removing the soil for this purpose, several relics were discovered,—notably two or three bases and capitals of Norman pillars, which seem to point conclusively to the fact of a much earlier building having existed on this site or its neighbourhood. These remains have been utilised for the foundation of pillars of the later church. The curious old font-bowl (supposed, however, by a learned professor to be the base of a cross, and subsequently converted from its original purpose) now rests within the church. The seats are open benches raised slightly above the general level of the floor. These and the chancel stalls, screens, &c., are of solid oak. The organ is placed at the eastern end of the south chapel, the remaining portion of the chapel being available for seats. The chancel is divided from the chapels by screens, with carved open tracery-work in the head. That on the north side is of more elaborate character, and is the gift of Mr. J. A. Busfeild, who has undertaken the restoration of the north chapel, the design being furnished by Mr. R. N. Shaw, of London. The Ferrand Chapel, an excrescence on the north side of the nave, has not been removed, but permission has been granted to convert the lower story into a vestry, an appendage of which the church was previously destitute. An oak screen now separates it from the nave. Another screen will also divide the tower from the nave. The old grave-stones have been relaid within the church, but it is hoped that ere long tiles may take their place. The heating of the church was a source of difficulty, owing to the interments. It has been, however, solved by placing Haden's hot-air apparatus in an iron chamber beneath the tower. The old organ, which was built by Messrs. Forster & Andrews, of Hull, about twenty-four years ago, has been improved and enlarged by the same firm. The cost of the renovations, including the organ, will be about 3,000*l*. The contractors were:—Masons, Messrs. Foulds, Bros., Bingley; Messrs. John Ives & Sons, joiners, Shipley; Mr. Dawson, plumber, Bingley; Mr. Thornton, slater, Bingley; Mr. Anderson, plasterer, Bingley.

Duffryn (Neath).—The new church of St. Matthew, Duffryn, has been consecrated by the Bishop of Llandaff. Duffryn is a small hamlet, formerly with a very sparse population, and adjacent on two sides to the parishes of Cadoxton and Skewell, and on the other to Neath. Lately some colliery works have been opened in the neighbourhood. Adjacent to these works stands the residence of Mr. Howel Gwyn. He resolved to build a church for the people of Duffryn, and endow it. The site chosen is one adjoining his lodge. On this a church has been erected by Mr. Gwyn, at a cost of about 3,500*l*. In addition, Mr. Gwyn endows the church with land to give an annual stipend to the clergyman. The new church is dedicated to St. Matthew, and consists only of nave, chancel, with organ-chamber, vestry, and tower. It was intended to be as purely as possible a type of the Welsh Church of the twelfth century. Mr. Norton, of London, architect, submitted a plan of a church of this description, which met with the approval of Mr. Gwyn, and the work of erecting it was undertaken by Mr. Rees Roderick, of Margam, who has also restored Llantrissant Church. The new church is built with Penant stone, from one of Mr. Gwyn's quarries, with Bath stone dressing. The design is Gothic, and the nave has a somewhat plain appearance, owing to the absence of aisles and a clearstory range. The nave is lighted both north and south with plain single and double lancet windows. The nave alone is 62 ft. long, with a width of 25 ft. in the clear. The chancel is 27 ft., with a width of 21 ft. On the north side there is an organ-chamber and vestry, and at the south-west end there is a porch, which is surmounted by a square tower, terminating in an open battlement, and in this tower will be placed a peal of six bells. At present the upper portion of it is incomplete. The tower, which below forms the entrance-porch, has a Gothic doorway, and this is surmounted by a carved stone statue of the patron saint. The walls of the interior of the church are stuccoed, and both nave and chancel have timber roofs in panels. The nave is covered with open benches, affording accommodation to 300 persons. The floor is formed with Godwin's tiles. The altar and the dais for the communion-table are formed with Kilkenny marble. At the entrance stands a carved font from the Bridgend stone. The pulpit is formed of the same class of stone carved, and bearing in the panels crosses of alabaster. This, with a bronze lectern, is the gift of the tenants of Mr. Gwyn. The east window is a three-light painted window, with rose beading. It was placed there by Mr. Gwyn, as a memorial of Mr. Matthew Gwyn, his brother. The subjects in the principal divisions illustrate passages in the life of Our Lord. The church is warmed by hot water, and lighted with gas, conveyed to it from Mr. Gwyn's private gasometer. The choir is plain, but in keeping with the seats in the nave. At present the ground is not inclosed in the manner it will be when the church is completed, but a lych-gate,—another feature of the old Welsh church,—has been built. The inclosed ground will be used as a graveyard.

Barrow.—The ancient church of St. Bartholomew at Barrow has been opened, after some necessary repairs and alterations were carried out. Mr. Douglas, of Chester, was the architect employed. He estimated that the expense of re-seating the church with open seats of pitch-pine, and providing a new south door, would be 280*l*.; while the vestry could be built, and the chancel re-seated and furnished, for an additional sum of about 200*l*. Mr. Jones, builder, of the Kaleyards, carried out the proposed alterations. The square pews have been removed, and open seats of pitch-pine substituted for them,—a change which has had the effect of adding to the accommodation of the church. The gallery, which formerly afforded accommodation for the school children, has been removed, being considered unnecessary, and its former occupants accommodated in the chancel, which was built in 1671 by Bishop Bridgman, formerly a rector of Barrow. The inner arch of the Norman doorway, on the south side of the church, has been restored, but the outer arch has been left untouched until a new porch can be built, while a new oak door has been provided. The four arches separating the nave from the aisle, and supposed to be about 300 years old, have also been restored; while the old stone flagging has been removed, and encaustic tiles substituted. A new roof, new windows (on the south side), and a new porch are still required. The cost of the alterations already made amount to about 400*l*.

Burwardsley. — The little church at Burwardsley, after undergoing considerable repairs, has been re-opened for divine service. The edifice was used as a chapel of ease for Bunbury prior to 1735. According to the accounts of the parishioners, the floor of the old church was worn into holes, and strewn with rushes, the roof was entirely decayed, and the building was fast becoming a ruin. Now it is different, and when the extension is carried out, as at first contemplated, of adding a chancel with the chancel arch, where the east window is, it will be sufficient for the wants of the neighbourhood. Exteriorly, the most conspicuous portions of the work done comprise a new buttress on the south side, repair of the west window, reglazing of the windows with the exception of the east windows, and a new slated roof with a bell-turret and louvres. In the interior, the old open oak-timbered roof has been furbished up, and the old pew oak has been used for boarding the walls to the height of 3 ft. 9 in., and the walls have been plastered and coloured. The new seats are open, and, like the lectern, are of pitch pine, stained and varnished. They will accommodate about 180 persons. The pulpit and reading-desk have been restored. The chancel and aisle have been laid with tiles, and some attention has been given to the heating apparatus, the hot air being admitted now at the entrance to the church. The cost of the entire work, done by Mr. Fleet, of Beeston, under the superintendence of Mr. Chatterton, the

architect being Mr. Douglas, of Chester, will be about 270*l*.

Kirkby.—The new Church of St. Chad, at Kirkby, between Liverpool and St. Helen's, has been consecrated by the Bishop of Chester. The building, which has been erected by Lord Sefton, at his own expense, was designed by Mr. Paley, of the firm of Paley & Austin, architects, Lancaster; and the contractor was Mr. E. Gabbut, builder, Liverpool. The total cost of the building has been about 14,000*l*. It is calculated to seat 600 persons.

Harwell (*Berks*).—The chancel of St. Matthew's Church, Harwell, has been re-opened for public service by the bishop of the diocese; after a restoration by the lay rector, Sir John Chetwode, bart. Sir John has had the floors laid with encaustic tiles, the old altar-rails of oak restored, and removed to their proper place, and the choir benches remodelled. There is also a new altar-table made of oak, by Isaac Hitchman, the village carpenter, and the tiles were laid by Joseph Harris, the village mason. It was the wish of the vicar, and the desire of the meeting at the restoration of the nave in 1867, that a Purbeck marble slab, some 8 ft. long (discovered in the north aisle, and now placed at the entrance of the chancel), should have formed the new altar, but with the advice of the bishop, the intention for the present is abandoned. The original stone altar, bearing five crosses, although broken almost to pieces, has been repaired by Joseph Harris, and forms the base of the new altar-table.

Sheerness.—The foundation-stone of the new church of St. Paul, situated in Terminus-road, has been laid by the Bishop of Dover. The church, which is to be built in the Gothic style, will accommodate 500 persons, and is designed by Mr. R. Wheeler, architect, Tunbridge Wells.

DISSENTING CHURCH BUILDING NEWS.

Stamford Hill.—A Congregational Church, which has just been erected at Stamford Hill, by the Congregationalists of that improving locality and of Hare-court Chapel, Highbury, has been opened for public service. The building, which was designed by Messrs. Tarring & Sons, architects, and built by Messrs. Dove Brothers, is in the ornate style of Gothic, and is constructed of Kentish ragstone, with Bath stone dressings, and with its tower and spire forms a prominent object on the summit of the hill. Its interior dimensions are 118 ft. by 51 ft. 6 in. It consists of a nave, aisles, and galleries. There is a transept extending out at each side, and an apse at the eastern end, and it supplies seat accommodation for 1,380 persons. At the back there are public and other vestries, apartments for the chapel-keeper, a lecture-hall, capable of seating 300 people, a kitchen, and other accessories. The total expenditure for the church has been 13,000*l*.

Aylestone (*near Leicester*).—A new Nonconformist Chapel has been opened in this village. It is in the Early Gothic style of architecture, the walling being of Clarkson's patent pressed red bricks, with Derbyshire stone dressings. It will seat about 200 adults, and has cost 500*l*. The architect was Mr. Tait, of Leicester, and the contractors were Messrs. Glover, of Blaby.

SCHOOL-BUILDING NEWS.

Maidstone.—The St. Faith's School, for girls and infants, one of the series projected a short time since, has been formally opened. The Earl of Romney headed the list. In the new parish of St. Faith two new buildings were contemplated, one for the reception of girls and infants, and to contain 296, which has just been opened; and the other for 125 boys, which will very shortly be taken in hand. A third school is nearly completed in St. Peter's, while two others are in course of erection, for ragged children, in Bonny's-yard, and the schools at Tovil have been enlarged. Altogether additional accommodation for 700 children will be provided. The St. Faith's girls' and infants' schools, which give accommodation for 296, cost, with land and fittings, about 1,700*l*. The architect is Mr. Stephens, and the builders are Messrs. Clements & Wallis. The building is a plain one, of brick. It is similar to the All Saints' School, with this exception, that it is built in two stories, the infants being on the ground floor, and the girls above.

Bowling (*Bradford*).—The new schools which have been recently erected in connexion with St. John's Church, Bowling, have been opened by Bishop Ryan, vicar of Bradford. The foundation-stone was laid in the summer of last year. The new schools adjoin the old one in Wakefield-road, which for some years has been inadequate to supply the wants of the thriving district in which it is situated. The new buildings overlook the green fields, and they have attached to them spacious playgrounds. They are arranged in the form of the letter H, and consist of a boys' school, 56 ft. by 19 ft.; girls' school, 49 ft. by 19 ft.; and infants' school, 48 ft. by 19 ft.; with two class-rooms. The rooms are ceiled on the level of the collar-beam, about 19 ft. from the floor, and the walls are lined with dress-boarding up to the inner side of the window-sills, and plastered above. Ample provision has been made for the ventilation of the rooms, and the warming will be effected by means of a stove in the basement, in addition to which fire-grates are provided. The boys' school is divided from the girls' by a wooden partition, which, being easily removable, allows the two rooms to be used together for large meetings, &c. The seats and desks are of pitch pine, with Sidebottom's patent standard, by which they can be made either into tables with seats or seats with backs. The style of the building is Gothic, and the four main and smaller gables have tracery on the window-heads. The remaining windows have plain ashlar dressings. A bell-gable is formed in the chimney-stack of the infants' school. The contractors were Mr. Samuel Jackson, mason and joiner; Mr. John Schofield, plumber and glazier; Mr. Woodhead, plasterer; Mr. Stoner, slater; and Mr. W. Dawson, painter. The architects were Messrs. Healey, of Bradford. The total cost, including the site, has been about 2,000*l*.

Milton (*Hanley*).—New national school buildings have been erected here, on a site given by the Right Hon. Sir C. B. Adderley, M.P., in the most prominent and central position in the village. They are in the Gothic style, plain. The accommodation provided is for children in the mixed school, which is 40 ft. by 18 ft.; and for infants in the classroom, which is 14 ft. 3 in. by 13 ft. 6 in.; and for special purposes, such as tea meetings, both rooms can be thrown together by means of a movable partition. Adjoining the school a teacher's residence has been erected. The schoolroom is fitted up with desks, which will also serve as tea-tables, and for seats with inclined backs, as also for forming classes for Sunday-school purposes; and the class-room is fitted up with a gallery. Both the rooms are lofty, well-lighted, and ventilated. The ceiling is at the collar considerably higher than the walls. At the rear of the schools there are playgrounds, which are asphalted and enclosed with walls, and suitable out-offices for each sex, and it is intended to fit up the playgrounds with swings. The front boundary of the site, which is up to the turnpike-road, is inclosed with a brick wall, with open-framed wickets to the several entrances. The materials which have been used are red brick, relieved by bands and voussoirs of blue bricks, and all the strings and labels are of moulded blue bricks. The principal elevation, which is to the turnpike-road, shows a gable for the mixed school, which is filled in with three lancet windows and a rose window above, and the gable is surmounted by a bell gablet, fitted with a bell and finished with an iron vane. The remainder of this elevation, consisting of the classroom and the principal front of the residence, harmonises with the school. The contract for the building has been executed by Messrs. J. & G. Moss, of Ford Green, from the design and under the superintendence of Mr. George B. Ford, architect, Burslem.

STAINED GLASS.

Upton Church.—The great west window of this church has been filled with stained glass. The window is divided by the stone mullions into three lights, each about 15 ft. high and 3 ft. wide, with the centre light terminating in three tracery openings. The whole window is illustrative of the Crucifixion. In the centre light is our Lord, with the Mother, the Magdalene, and St. John at the foot of the cross. In the side lights on either side are the two thieves. Grouped around the impenitent thief are figures of those who mocked and reviled, while in contrast beside the penitent thief are seen one of the Marys, Joseph of Arimathea, and the converted centurion. Towards the upper part of the composition are angels in radiating golden light hovering over the scene. An enriched floriated panel underneath contains the lamb and passion-flower, and in the tracery openings at top, issuing from palm-branches, is the descending dove, with devotional angels on either side. The window is a presentation from Mr. W. Inman, of Upton Manor. Messrs. Ballantine & Son, of Edinburgh, are the artists of the work, and, we believe, have executed the whole with the approval of Mr. John Cunningham, the architect of the church.

St. Chrysostom's Church, Liverpool. — Two stained-glass windows have been erected in this church, by the same firm, to the memory of the late vicar, the Rev. T. Cowan. These windows have each three upright compartments, and represent the six Christian acts of charity (Matthew xxv. 35, 36). Above these springs stone tracery. The geometric openings therein are filled with glass of floriated design, and the two central shapes contain angels.

FROM AUSTRALIA.

Wangaratta.—The want of a hospital has long been felt in Wangaratta. What may be termed the administrative portion of the new building comprises an operating-room, male and female wards for accidents, board-room, surgeon and matron's rooms, linen-closet, store-room, and servants' rooms. The wards of the hospital proper are connected with the administrative department by paved passages, there being a distance of 12 ft. between each of the wards and it, which arrangement allows a free circulation of air round each ward, leaving no angles in which it can stagnate, and at the same time affording the means of carrying out the principle of subdivision of the sick. The cubical quantity of air allowed to each bed is 1,430 ft. The nurses' rooms are situate at the entrance of the wards. Enclosed at the end of each ward are the lavatories, water-closets, and baths; and attached to each ward is a scullery. The passages and staircases are of stone. Lifts are provided, and every means to economise labour has been studied. The kitchens and other offices are situate in the rear of the administrative department, with which they are connected by a covered way. The building is of ordinary picked red bricks, with patent pressed dark red brick dressings. To ensure ventilation, the introduction into the walls of ventilating flues has been adopted. The dispensary will be separate from the hospital, and will comprise waiting and consulting rooms, laboratory, and dispensing-room. The style of the architecture is modern Tudor. Mr. Leonard Mason is the architect.

Sydney.—The new Town-hall, the chief stone of which was laid by the Duke of Edinburgh, is making progress. The site is part of the cathedral close. The building, of which the *Australian Illustrated News* has given an illustration, has a frontage of 153 ft. east to George-street, the principal business thoroughfare from which alignment it sets back 40 ft., collimating with the east front of the cathedral. A space of about equal width, and 270 ft. in length, has been reserved on either flank of the building for ornamental planting. The building as planned would extend in length 245 ft. west from the frontage. The existing contract, however, comprises only the foundations and basement of what may be termed the business portion, and has a depth of 150 ft., or a superficial area of one half acre nearly. The foundations have been built on the bed rock at a depth of 15 ft. from the natural surface. It is a dense red sandstone, indurated with grit, almost level on the surface, and little inferior in hardness to granite. The ground-floor is elevated 8 ft. above the level of George-street. A flight of steps, 36 ft. in length, lands upon a colonnade, from which the principal entrance conducts to the central hall. At either end of the colonnade or portico, recessed vestibules open on the staircases and corridors; these will be of fire-proof construction, and respectively 8 ft. and 10 ft. in width. The central hall is octagonal in plan, disclosing engaged columns, panelled dado, niches for sculpture, enriched entablature, groined and coffered ceiling, and tesselated pavement. A spacious opening in the hall, and others contiguous to the staircases, give direct access to the vestibule, which in its entire extent is 88 ft. in length and 50 ft. 6 in. in width. Its architectural character assimilates to that of the Venetian cortile, consisting in a continuous arcade over arcade in two orders, the lower supporting a spacious corridor

or gallery, the upper surmounted at a height of 40 ft. by a ribbed and coffered ceiling pierced for direct lighting and ventilation. The corridors enfilading the vestibule communicate with offices for the town clerk and assistants, the city engineer, surveyor and assistants, city treasurer, clerks, city solicitor, health officer, and others. The dimensions of these offices average 20 ft. by 18 ft. 6 in., and have a uniform height of 20 ft. The first floor is appropriated to the council chamber, 42 ft. by 31 ft. 6 in., and 28 ft. in height; mayor's and aldermen's room, respectively 26 ft. by 22 ft.; library and committee-room, 42 ft. by 31 ft. 6 in.; mayor's reception-room and withdrawing-room, of similar dimensions to the council-chamber and library; fire-proof record-room, public gallery, reporters' sitting-room, waiting-room, ante-room, corridor, and balcony. The upper floor provides accommodation for chief draftsman, assistants, contractors, and fire-proof plan and instrument room, lavatories, &c. The town-hall, as designed, has a clear length of 132 ft.; width, 62 ft.; and height, 66 ft. When thrown open *en suite* with vestibule its dimensions will be:—length, 212 ft. 6 in.; width, 62 ft. It is flanked on three sides by an open colonnade, 12 ft. in width, and a corresponding terrace at a height of 21 ft. from the floor. At either level spacious retiring-rooms are provided. Internally a gallery, 5 ft. in width along the sides and 10 ft. at either end, commands the hall; double orchestras have been arranged, with external means of approach, and ample provision made for the safe and speedy egress of a crowded assembly to the grounds which environ the hall. Wide and covered staircases conduct also from the colonnade to the refreshment-room, situate beneath the hall. Its dimensions are 90 ft. by 60 ft., with a clear height of 18 ft., and in convenient proximity are placed the kitchens, purveyor's-room, serving and waiting rooms, stores, and cellars. The general style of architecture is Italian; the salient faces are enriched by coupled columns, superimposed and detached. These flank capacious circular-headed window openings, deeply recessed and of Venetian character. The tower rises to a height of 180 ft., and terminates in an open campanile; the several floors are available for cloak-room, observatory, telegraph-rooms, &c. The present contract, providing for the excavation and building the foundations and basements of a portion of the building, was to be completed within three months. The plans have been modified to some extent from the original prize design, accredited to Mr. J. H. Wilson, who superintends the erection of the building, by direction of the municipal council. Mr. Thomas Alston performs the duty of foreman of works; the contractors are Messrs. Kelly & M'Lloyd.——The new City Bank, Sydney, is in progress. The appearance of Pitt-street North has been completely changed during the last few years; and the low mud hovels which formerly lined the thoroughfare have given place to massive and ornamental buildings, which would do no discredit to any city. The style is Italian, freely treated. The front elevation faces Pitt-street, and has for its central feature a projecting portico, crowned with a cornice and balustrade. The main line of the front recedes about 7 ft. from the line of footpath, the space on either side of the porch being enclosed with a stone wall and balustrade, with iron railing. The windows on either side of the porch have arched heads, supported by small independent columns. The upper windows are of similar form, but with lighter details. The elevation is surmounted by a cornice and balustrade. The building will probably be by this time completed; and its estimated cost is about 17,000*l*. Mr. George Allen Mansfield is the architect, Mr. Alex. Dean, the contractor; and the masonry has been executed by Messrs. R. & W. M'Creddie.

FROM SCOTLAND.

Glasgow.—The foundation-stone of a Reformed Presbyterian church has been laid at Rutherglen, near Glasgow. The edifice is in the Early English style of architecture, and built of square-dressed rubble stone-work, with the dressings to the principal entrance door, windows, &c., of freestone. The front elevation will consist of a large gable, with buttresses and moulded stone coping, with carved stone finial; the entrance-door being in the centre, and having moulded jambs and shafts, with bases and capitals supporting a deeply-moulded pointed arch, with label moulding, and carved bosses. On each side there will be a double-light traceried window, which will afford light to the vestibule above the door. In the centre of the gable will be a large four-light window, with pointed arch, filled with tracery. At the south-west angle of the church, there will be a tower and spire, 115 ft. high. In the lower part of the tower will be the side (south) entrance-door, having deeply-splayed jambs and pointed arch, and on the west a trefoil window; the upper part of the tower to be occupied by pointed-arched windows, having moulded jambs with shafts, bases, and capitals of columns, which give light to the gallery staircase. The belfry windows are two-light, and traceried with a cornice above, from which springs the stone spire, built of coursed ashlar work. A staircase in the tower will give access to one of the galleries, and at the corresponding angle of the church there will be a projecting octagonal staircase leading to the other gallery, the lower portion being lighted by a trefoil window, similar to that in the tower, and the upper part by double-light cusped windows, surmounted by a conical roof. The church will be lighted by the large window in the west gable; five lancet-shaped windows in each of the side walls, and a rose-window, 14 ft. diameter, in the end gable above the pulpit. All the windows will be glazed with cathedral glass, and have borders of stained glass. The body of the church will be 69 ft. by 50 ft. wide, divided into nave and side aisles by cast-iron columns, with foliated capitals supporting the side galleries, above which there will be another series of columns, also with enriched capitals, from which spring moulded and enriched pointed arches. The ceiling of the nave will be flat, and divided into bays by the tie-beams and hammer-beams of the roofs, which will be exposed to view, and rest upon carved corbels; the height of the side walls will be 25 ft., and the nave 38 ft. The gallery front will be of timber framing, with cusped ornaments; the pulpit of the semi-platform type, upon a slightly raised dais: the pews will be open benches, and for 750 sittings. The cost 3,000*l*. The architects are Messrs. George P. Kennedy & R. Dalglish, of Glasgow.

PATENTS CONNECTED WITH BUILDING.

Sliding Gas Pendants.—*J. Horton.* Dated 6th March, 1871. — These improvements in gaseliers consist in combining a central light, capable of being raised and lowered, with a series of two or more fixed lights. The central sliding light is carried by a gas supply-pipe sliding in the tubular body of the gaselier, and is supported by chains and a balance-weight or weights. An ordinary water-slide or gas-joint or packing is used to prevent the escape of gas. A gas-joint or packing for this purpose is described, consisting of two concentric tubes secured in the tubular body of the gaselier, and two washers or packings fixed by screw caps or plugs in the larger tube; the smaller tube is filled with bees' wax. The gas-pipe of the central light passes through and slides in the chamber containing the bees' wax, and also through holes in the washers and screw caps. This gas-joint or packing is applicable to sliding gas-pendants and sliding gas-brackets.

Brickmaking.—*J. F. M. Pollock.* Dated 9th March, 1871.—In constructing a self-contained machine for making bricks according to this invention, a receiving hopper is combined with a pug-mill, having its shaft and lower portion peculiarly constructed, and provided with a sliding bottom or mould. The pug-mill shaft is composed of a series of knives, each consisting of a boss and one or more blades. The bosses are provided with projections and recesses, taking into one another, so that the bosses themselves form a shaft, the tortional power being transmitted from knife to knife by the projections above mentioned. The bosses are formed with central holes, and are secured vertically by a bar or tie passing through them. Motion is given to the knives by means of a disc arrangement provided for the purpose. The lower portion of the pug-mill feeds the clay to a tapered chamber, assuming at its lower end the form of the article to be moulded. Across this chamber is or are placed a flat bar or bars, whose edges are situated upwards and downwards to insure the delivery of the clay downwards. The pug-mill is furnished with a sliding bottom or mould, which receives motion from a rocking shaft, and suitable gearing or apparatus is specially arranged for giving the requisite motions, removing the bricks, and so forth. The machine may be constructed so as to mould two or more bricks simultaneously. In some cases a circular table and special gearing are used instead of the sliding bottom and gearing already mentioned. When the table is of the kind described in the specification of the patent No. 2,911, of 1869, the framework is composed of a base plate, bearing side frames or pillars supporting a top frame, and suitable shafting and gearing are provided for giving the various self-acting intermittent and other movements. The two main vertical shafts receive motion from a horizontal shaft carrying worms and wheels, rotating in vessels containing oil or other lubricant. Arrangements are made to preserve the gearing from dust, and drippants are applied for receiving superfluous oil from the bearings. Another part of the invention relates to pressing bricks, whilst confined in moulds, by means of plates of smaller area than the sides of the bricks against which such plates are intended to operate. The various improvements are applicable to machines for making tiles and other articles.

Machinery and Tools.—*W. Thompson.* Dated 17th March, 1871.—This invention consists in, first, forming tools for cutting marble, stone, slate, and other minerals of tubes of steel or other metal; secondly, the general arrangement of machinery for cutting marble, stone, slate, or other minerals.

Regulating the Supply of Water.—*W. Morris and G. Eskholme.* Dated 30th January, 1871.—This invention consists—first, in the use of a movable seat in lieu of a fixed seat in the ball-taps employed in connexion with the waste-preventing serving-boxes or water-closets, and other purposes, in order to reduce the liability to injury of the seating of such ball taps. Secondly, in the combination of a sliding discharge-pipe, with a cylinder or water-box containing a movable valve-seat resting on the discharge-pipe, so arranged as that on withdrawing the discharge-pipe from the valve-seat, a given time will elapse before the seat, by its descent, will close the discharge-pipe again, thereby not only preventing continuous waste, but further insuring the delivery of a regulated quantity of water. This is applicable to water-closets, stand-posts, and other like purposes. Thirdly, in the use of a supplementary service-box in water-closets, situate between the supply cock and the basin, for the purpose of insuring the delivery of a proper amount of water into the cistern after the cock has been shut, in order to properly trap the closet.

Locks and Latches.—*H. C. Harvey and T. Walton.* Dated 1st February, 1871.—According to this invention the bolt, which acts both as a lock-bolt and latch-bolt, is provided with a slide working in a recess across the bolt, the said slide being moved from side to side of the bolt so as to lock or release the bolt by the action of the key. A slot in the bolt works upon a strong stump, and a recess in the rear of the slide can be brought or not to coincide with the slot in the bolt. On the slide is a lever, in the gatings of which a stump on the slide engages. The key first acts upon the lever to release the slide, and the latter is then removed by the key into such a position that the recess in the slide coincides with the slot in the bolt, when the said bolt can be withdrawn. When the slide is so moved across the bolt that its slot does not coincide with the slot in the bolt, the latter is fixed, and can only be withdrawn by the action of the key upon the lever and slide. The case of the lock is made of sheet metal, and is strengthened, and a guide for fitting on the cover provided by means of raised strips fixed along the inside of the case. The keyhole is double, so that the lock can be used without alteration with any kind of door. The follower of the latch is made to operate upon the bolt by means of a projecting tooth on it engaging in a recess between two teeth in the crank, or the reverse arrangement may be used. Around the follower loose bushes are placed to facilitate its motion and to prevent it becoming fast.

Furniture.—*J. E. Tysall.* Dated 4th February, 1871.—This invention consists in inlaying or ornamenting by the use of different-coloured woods substantially in the following manner:—Upon the groundwork of the article to be inlaid or ornamented is secured a layer of dark wood, or wood of a colour different from that of which the article is made, and upon this dark or coloured wood is secured a thin layer or veneer of the same wood as that of which the groundwork of the article or surface of the article is

made. Portions of the upper layer or veneer are cut away in any desired ornamental form, the dark or coloured wood beneath it being exposed at the cut-away parts, so as to give the surface the appearance of ordinary inlaying. The exposed surface of the dark or coloured wood may be carved, or portions may be incised or pierced, so as to expose portions of the wood beneath it. The application of the layers of different-coloured woods may be limited to the part or parts to be ornamented, or a slab may be inlaid or ornamented and inserted in the groundwork of the article, or the whole of the groundwork of the article may be covered with the layers of different-coloured woods.

Improved Apparatus for Preventing Explosions in Bath or Domestic Boilers.—*W. Randell.* Dated 10th January, 1871.—A safety-valve is adapted to the tap, and must be opened every time water is required to be drawn from the boiler.

Machines for Moulding and Pressing Bricks.—*W. R. Lake.* A communication. Dated 11th January, 1871.—A mould-wheel and feeding-screw are arranged upon the same shaft, and the mixing-arms of the pug-mill are on the same shaft as the mould-wheel. The tub-bottom is also arranged around the shaft that bears the mould-wheel and feeding-screw. There is also a follower cam-track around the driving-shaft. The tub-bottom has one side which is provided with a feeding apparatus arranged to fit closely over the mould-wheel, and the other side is raised above the mould-wheel, to allow of the expulsion and removal of the bricks. There is a set screw in the lower bearing of the driving-shaft for adjusting the mould-wheel to the tub-bottom. There are lateral flanges on the tub-bottom secured upon the frame by set screws for adjusting the position of the tub-bottom. The frame is composed of two uprights, connected by brace-bars all cast in one piece; one-half or part of the tub is securely fixed, so as to fulfil the additional function of a support to other portions of the machine, and the other part thereof is hinged to the fixed part, so as to swing open. The cam-track has adjustible sections. The moulds are constructed to form the bricks vertically edgewise in the mould-wheel. The brick-moulds are arranged in combination with a traverse belt and carrier belt for automatically removing the bricks from the mould-wheel. An adjustible draught-arm is used in combination with a sweep applied to the driving-shaft.

Tiles for Roofs and other Parts of Buildings.—*J. A. Wade and J. Cherry.* Dated 12th January, 1871.—The walls are built with outer and inner courses, and a space between them, such courses being tied with glazed bricks, ridged or fluted, to prevent the lateral passage of water; also with channelled bricks to act as spouts at the upper part, and similar bricks at the lower part to carry off water through perforated bricks. Glazed bricks set in cement are also used for the "damp courses." The tiles have dovetailed, rabbeted, or undercut flanges, similar to those in patent No. 1173 (1870), but instead of being held together by separate fastening pieces, each tile is formed with such flange on one edge, and a fastening piece of corresponding section on the other edge. Other tiles are made with locking flanges on considerable portions of their upper and lower surfaces, so as to admit of their hanging together on roofs without depending on knobs or nails for support as usual. Such tiles may also be used for sheathing party walls temporarily.

Window Blind Mountings.—*H. B. Young.* Dated 12th January, 1871.—These improvements relate to apparatus by which the level of the blind-roller may be regulated so that the blind may hang perpendicularly, also to the governance of the movement of the roller in being caused to rotate in either direction, or in holding the same stationary. The apparatus may be fitted at the end of the roller, and should principally consist of a reel barrel, a reel and spindle, with spring bearing, a spring acting against the same, and a leather block secured to the brackets of the roller.

Window Blinds.—*W. Parnell.* Dated 14th January, 1871.—The feature of novelty of this invention consists in causing a spring roller to press on that part of the cord of a roller window-blind that is in the groove of the pulley employed to revolve the roller for raising and lowering the blind, and by these means to hold the blind firmly at any desired height.

Spindles and their Knobs or Handles.—*S. Wilkes.* Dated 26th January, 1871.—These improvements refer to a spring arrangement applied to the spindle, whereby the knob or handle is secured thereto without screws or other means of connexion heretofore adopted. The spindles are adjustible to the varying thicknesses of doors, drawers, and locks, owing to the spring arrangement being capable of being shifted in position.

Gas Burners.—*G. Haseltine.* A communication. Dated 23rd February, 1871.—This invention consists in a peculiar arrangement of two concentric rings of gas jets, and presents several novel characteristics of construction whereby the inventor obtains a uniform and perfect diffusion of the gas. He also secures a perfect control over the gas issuing from the inner concentric ring of jets. Duplicate concentric rings of jets are combined with gas chambers, and the latter are connected with bifurcated sections of a pipe, and respectively supplied with gas through suitable passages. He uses a regulating key with the inner ring of jets in connexion with a passage, which, above the key, is divided into branch passages, and thereby regulate the flow of gas to the inner ring.

Coffer Dams.—*A. M. Clark.* A communication. Dated 11th May, 1871.—The inventor constructs a coffer-dam so that it can be easily moved, sunk in place, and removed, the walls being so constructed that after one section of what is to be a continuous wall is built within it the dam can be moved forward in the line of the wall, and by devices be clamped fast to the part completed, and another section be then built and joined on. The invention also includes improvements in the construction of some of the parts of the shell, and in the structure as a whole. Also in the employment within the dam of loose piles to act as girders to the dam in raising and lowering it; and also apparatus for placing and moving the dams.

Miscellanea.

The Poor Organ-Grinders.—Some disgraceful disclosures are being made in the Clerkenwell Police-court as to the treatment of the organ-men in their crowded and filthy domiciles in the neighbourhood of Holborn. Mr. Barker said he was determined to stop this overcrowding of Italians, who were treated, as far as their lodgings were concerned, far worse than many dogs were. Some time ago the places had been ordered to be repaired and cleansed. On the part of the padrone or master of one of these lodging-houses it was urged that the Common Lodging-house Act, 29th and 30th Vic., cap. 90, sec. 41, did not contemplate overcrowding by members of the same family, or by servants; and here, if the parties in the house were not exactly "members of the same family," they were the servants of the padrone. The defendant brought these organ-grinders from Italy, provided their passports, paid their passage, engaged them for a term (generally of years), and undertook to provide them with food, clothing, washing, board and lodging, and with an organ, receiving as his remuneration half of their earnings, the remaining half being accumulated until the expiration of the term of service, when it was equally shared between the employer and employed,—rather too much in favour of the organ-grinder to be true, we fear. If the employed were successful, it was added, the bargain was not disadvantageous to the employer, but otherwise if unsuccessful, as the latter took the sole risk. Some of the cases were adjourned, and others settled by sentences of fine or imprisonment. We described these very places as overcrowded with Italians some years ago.

Mr. Brassey, M.P., on Labour and Capital.—Mr. Thomas Brassey, M.P., has delivered a lecture in the Workmen's Hall, Birkenhead, on the relations of labour and capital. Mr. Edward Mills presided, and the hall was crowded principally by working men. Mr. Brassey's able lecture has been well quoted. It contained much useful advice and information, and advocated, amongst other things, the establishment of Courts of Conciliation, composed of masters and men, the advancement of co-operation, the cultivation of prudential feeling amongst the workmen in their private affairs, as to early marriages, &c.; and the establishment of bonds of sympathy between class and class, by bringing them more together than heretofore: the laws of capital and labour, supply and demand, were also considered.

The Sewage Works at Merthyr Tydvil. The population of this town is 50,000, and the daily dry weather flow of sewage 60,000 gallons, or 12 gallons per head. The method of purification at present employed is that of intermittent downward filtration on a limited area of land, arranged by and carried on under the superintendence of Mr. Bailey Denton, C.E. The area employed for the filtration is twenty acres, and although not yet fully prepared, the whole of the sewage has been passed through it for the last three months. It is intended to be divided into four beds of five acres each, receiving in succession the whole sewage continuously for six hours each per day. Ten acres only, or two beds, are as yet completed, and these now receive, and have been receiving for the last month, the whole sewage for twelve hours each per day. The crops this year were all in a fine healthy condition,—the peas exceptionally so. All the vegetables had been planted since the 14th of June, and the growing crop has been sold, and realised an average of 17*l.* 15*s.* per acre. Although the ten acres on which these crops were growing had for the last month received the whole of the Merthyr sewage, yet not the slightest offensive odour was given out, either from the land or the carriers, which, built of brick and cement, were efficiently arranged for the even distribution of the sewage. Mr. Bailey Denton has been requested to furnish a report upon the practicability of applying a similar system for the purification of the sewage of Birmingham.

The Insanitary State of Wolverhampton. In a report to the Town Council, by the Sanitary Committee, based upon an inspection made in August by the committee and other members of the council, they "regret that they have to report that they find a remarkable concurrence of testimony to the fact that nuisances of a dangerous character are almost universally prevalent, and that the town is in a fearfully insanitary condition." Some of "the worst and most offensive of the nuisances" are described under the heads of "privy accommodation," "midden pits," "pigsties," "water supply," and "unpaved yards," with the additional remark "that the numerous other insanitary abominations are described in the reports submitted to your committee, but an enumeration of them would fill a volume." Further on the committee say they are "of opinion that abundant evidence has been placed before them to prove that all the local circumstances which are essential for the propagation of cholera and typhoid fever exist in frightful profusion in all parts of the town;" and evidence shows them "that all the elements are present which are requisite for the rapid spread of any contagious disease provided it once gets a start." The remedies proposed by the committee are:—The appointment of a medical officer of health; the removal and disposal of night soil by a separate committee; the whole time of two inspectors to be given to the work of the Sanitary Committee; and the provision of certain structural arrangements for privies and cesspools, and the removal of night soil.

The Proposed Covered Market for York. The long vexed question of a covered market for York has been decided as far as the special committee appointed is concerned. It is proposed to make a frontage to Parliament-street of 21 ft., the market to extend backwards to the Great Shambles. It will be 194 ft. long, and 60 ft. wide, and will have four entrances, one from Parliament-street, one from High Jubbergate, one from the Little Shambles, and one from the Great Shambles. The internal area will be 2,046 square yards, and the whole area purchased will be 2,888 square yards. Three houses will be taken down on the north-east side of the Shambles, and two houses in Colliergate, thereby insuring a carriage entrance from that street 30 ft. wide. According to the City Surveyor's estimates, the cost will be 18,423*l.* Adding to this 10 per cent. for contingencies and Parliamentary expenses, the total cost will be 20,529*l.*

An Analyst of Food desirable.—One of the Lambeth vestrymen, speaking on the necessity of appointing a public analyst for the parish, stated, amongst other things, that a quantity of red lead was found in some cocoa, purchased in the parish, and some butter was found to have contained a quantity of rags. The matter has been referred to a committee. Something more than the mere appointment of an analyst is requisite, as experience has shown.

A Self-taught Mathematician. — Mr. Thomas Barker, a self-taught mathematician and practical engineer, has just ended his days as a "poor brother" in the hospital of the Charterhouse. He was the son of a farmer at Old Park, Durham, and the solution of many of the most difficult problems in the earlier stages of railway surveying and construction was due to his genius. It was he who invented the celebrated method of laying down railway curves, and the *Durham Advertiser* says that he "laid out the Stockton and Darlington Railway, the first line in the kingdom." He also laid out the atmospheric line from Dublin to Kingstown; and in the infancy of the railroad system he was largely engaged in many parts of the kingdom. The last line which he surveyed was that projected by Mr. George Hudson for connecting Lowestoft with London, and for making that town on the eastern coast a second Liverpool,—a project which the ruin of the "Railway King" extinguished. Mr. Barker was the author of several works on mathematics, both theoretical and practical.

The Old Sea-Water Town Pump at Brighton.—The remains of this old pump have been discovered by accident. The original chamber which covered it was come upon when digging out the road for the Aquarium works. It is situated beneath the road immediately to the east of the old entrance-gates to the pier, by Ratty's toll-house. The Aquarium Company's builder rented the chamber—ignorant of its original purpose,—to store cement in. It is vaulted, and about 25 ft. by 15 ft., with a brick-arch passage, about 10 ft. long, leading into it. One of the men, while working there, happening to throw his shovel down somewhat forcibly, was surprised that it made a hole, opening into a hollow beneath. Dropping down a stone, he heard the splash of water. Calling a fellow-workman, they enlarged the hole, and having first let down a candle, they got a ladder and proceeded to explore, when they discovered the gear of the old well. It appears that the gear, when the well was disused, was covered up with oak planking, which had become rotten.

Queen Victoria-street, London.—Several new buildings here are either in course of erection, or about to be commenced, the lower portion to be devoted to shops, and the upper floors to offices. One block, nearly opposite the Church of St. Mary, Aldermanbury, and estimated to cost between 25,000*l.* and 30,000*l.*, will have a frontage of about 120 ft., and a height of 80 ft. The elevation will be Venetian in style, and in Portland stone, with marble pilasters and clustered columns. In another part of Queen Victoria-street a pile in the Italian style in Portland stone is about to be commenced; and close to the Church of St. Mary, Aldermanbury, a block of buildings, 50 ft. high, also in the Italian style, has been contracted for. It will have an elevation of Portland stone, and the pilasters will be of polished granite.

National Education League.—The annual general meeting of this League has been announced to take place at the Masonic Hall Assembly Rooms, Birmingham, on Tuesday and Wednesday, the 17th and 18th of October; and we are informed that many influential names and large deputations from various leading towns in the kingdom will be included in the programme of the proceedings. The chair will be occupied by Mr. George Dixon, M.P.; and papers will be read by Sir Charles Dilke, bart., M.P., Mr. Alfred Illingworth, M.P., Mr. R. W. Dale, M.A., Mr. Jesse Collings, Rev. Sonley Johnstone, Rev. J. W. Caldicott, M.A. (Head Master of the Free Grammar School Bristol), and other gentlemen.

The Promenade Concerts.—We willingly mention that Mr. Edward Murray, long honourably associated as acting manager with the promenade concerts organised by the late Mr. Alfred Mellon, and who has, with equal credit, filled the same position at Covent Garden Theatre during the recent series so successfully conducted by M. Rivière, has had the special privilege accorded him of an extra night, which will be identified with his personal interest. This first benefit of Mr. Edward Murray is fixed for Monday, October 16th—a special extra performance.

Hull Dock Company's New Offices.—These buildings in Hull are now finished and occupied. We will give particulars on another occasion.

Norfolk and Norwich Archæological Society.—The day appointed for the autumn excursion of the Archæological Society was a very rainy one, but, as all arrangements had been made, the "outing" could not be deferred. About a dozen persons met at the Dunham station of the Great Eastern Railway. Mr. Carthew acted as guide, and the party, which afterwards increased, visited Great Dunham Church, Beeston St. Mary the Virgin, Mileham Church and Castle, and Mitcham Church; then lunched, and proceeded to the churches of East Lexham, Newton, and Sporle.

Dorking Public Hall.—It has been resolved that the building of the new public hall be commenced forthwith. With this view the architect, Mr. C. H. Driver, has been requested to meet the directors, for the purpose of taking the necessary steps for proceeding with the works. A circular is to be issued to the public, setting forth the present prospects of the undertaking, together with a list of shareholders and the number of shares already applied for. It is now considered that the chief obstacles to its realisation are overcome.

Fall of a New Four-Story Building in Dundee.—In Dallfield-walk, the whole of the front wall of a new four-story dwelling-house presently in course of erection has fallen out on the street. A man visited the premises just before the wall fell, for the purpose of expelling a few children who had been playing in the inside. Having done what he intended, he heard something cracking, and, fearing what actually did occur, he made off by the back of the building. Scarcely had he got out when the wall tumbled.

Proposed Widening of Chancery-lane. At the meeting of the Metropolitan Board of Works, the Works Committee presented a report recommending,—"That a communication be addressed to the First Commissioner of her Majesty's Works, &c., representing to him the desirability of clauses being inserted in some Bill to be introduced in the next session, to provide for the widening of Chancery-lane." After a great deal of discussion the report was referred back to the committee for reconsideration.

Men out of Work. — In a discussion on the Poor Laws at the Leeds Congress, Mr. George Potter stated that in addition to the million of paupers receiving relief, there were in this country "700,000 able-bodied men out of work, and living on the labour and industry of others." Can this be correct? We can scarcely believe it. Some means shou'd at once be adopted to ascertain the facts.

Working Men's College, 45, Great Ormond-street, W.C.—The Art Classes already founded comprise—Elementary, Pencil and Chalk, Water-colour, Ornament, Architectural Drawing, Antique, Still Life, and Life; the teachers being Mr. W. Cave Thomas, Mr. Henry W. Brewer, and Mr. G. Rosenthal. The lectures on Perspective will commence on the 20th.

St. Paul's, Covent Garden.—Mr. Butterfield has been commissioned to alter and improve the church of St. Paul, Covent Garden. The galleries over the aisles are to be removed; open seats will replace the present pews, and the position of the organ will be altered.

Fire in a Timber Yard.—On Wednesday night, a fire, attended with great destruction of property, broke out in the extensive timber-yards of Mr. Lindsay, East-lane, Lock's-fields, Walworth. The flames spread with alarming rapidity, stack after stack of timber being completely destroyed.

A New Alliance.—We hear of an alliance between a certain number of Conservative peers, members of Parliament, and the working classes, as represented by some of their leaders. It is full of strange import, though, as it seems to us, promising more good than ill, and will call for serious attention.

Prints for the Patients.—The British Hospital for Diseases of the Skin, in Great Marlborough-street and Finsbury-square, has just received a handsome present of framed engravings for the decoration of the waiting-halls, from Mr. Henry Graves, the well-known publisher.

The late Charles Dickens.—A meeting has been held in Portsmouth with the view of raising a national memorial of the late great novelist, Charles Dickens.

TENDERS

For villa residence for Mr. James Wilkes, Chester-road, Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Thompson	£696 0 0
Hilton	658 0 0
Goodman & Burmore	565 0 0

For extension of spinning-shed for Mr. Thos. Lea, M.P., Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Hilton	£925 0 0
Binnian & Son	916 0 0
Thompson (accepted)	916 0 0

For coach-house, stable, &c. for Mr. J. Steward, Trimpley, near Kidderminster. Mr. J. T. Meredith, architect:—

Hilton	£322 0 0
Goodman & Burmore	299 0 0
Binnian & Son	257 0 0

For erection of shed, engine-house, and stack, for Messrs. Lowe, Brothers, Wribbenhall. Quantities supplied:—

Hilton	£469 0 0
Horton	469 0 0
Parton	465 0 0
Binnian & Son	448 0 0
Smith & Sons	380 0 0

For erection of weaving-shed, warehouse, dye-house, engine-house, stoves, drying-shed, and stack, for Messrs. Winnall & Fawcett, Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Binnian & Son	£3,560 0 0
Thompson	3,500 0 0
Goodman & Burmore	3,499 0 0
Hilton	3,400 0 0

For new premises for the Kidderminster Industrial Co-operative Society, Limited, Worcester-street. Mr. J. T. Meredith, architect. Quantities supplied:—

Goodman & Burmore (accepted)	£1,125 0 0

For building a house in the Terrace-road, Banbury, for Mr. Richard Bailey, exclusive of painting, glazing, plumbing, and paperhanging. Mr. H. Hacketi, architect:—

Davis, Brothers	£715 0 0
Kimberley	685 0 0
Claridge	668 0 0
Orchard, Brothers (accepted)	640 0 0

For conservatory, &c., at Highbury. Mr. Richard Martin, architect. Quantities supplied by Mr. Frederick Sparrow:—

Bridgman, Nuthall, & Co. (accepted)	£250 0 0

For new coal stores, meat larder, &c., for the Fever Hospital, Homerton. Mr. Jno. Walker, architect. Quantities by Mr. A. L. Buzzard:—

Walton	£1,638 0 0
Crabb	1,575 0 0
Blackmore & Morley	1,485 0 0
Nicholls	1,478 0 0
Mann	1,387 0 0
Vaughan	1,379 0 0
Waterson	1,197 0 0
Prout	1,195 0 0
Brown & Sons (accepted)	1,154 0 0
Robins (withdrawn)	866 0 0

For the erection of a workshop at Highbury Coach Factory, for London General Omnibus Company, under the superintendence of Mr. Tosh. Quantities supplied by Mr. A. J. Bolton:—

Dunford & Langham	£1,475 0 0
Pettigrew & Moyes	1,439 0 0
Pink	1,392 0 0
Parsons, Brothers	1,380 0 0
Cook	1,350 0 0
Randall & Cockle	1,310 0 0
Johnson & Co.	1,267 2 9
Thompson	1,230 0 0
Vaughan	1,224 0 0
Norris	1,217 0 0
Scutt	1,211 10 0
Rooney, Brothers	1,200 0 0
Minion	1,198 0 0
Crooker	1,190 0 0
Bleage	1,180 0 0
Ford	1,170 0 0
Goodman	1,133 0 0
Mann	1,111 0 0
Brown & Son	1,110 0 0
High	1,095 0 0
Wright	1,095 0 0
Robins & Co.	1,045 0 0
Atchinson & Walker (accepted)	1,025 0 0

For addition of two new rooms to the Independent Chapel House, Fareham, for repairs to ditto and school-room. Mr. J. Rosevear, architect:—

Jurd	£115 0 0
Rosevear	99 12 0
Tutte (accepted)	91 0 0

For new school at Stocking Pelham, Herts, for the Rev. C. Hartley and others. Mr. George Perry, architect:—

Gibbons	£319 0 0
Cornwell	315 0 0
Saggers	312 0 0